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THE TASKS OF ECONOMIC HISTORY

PAPERS

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The Roles of Leading Nations in the Economic Development of Other Areas

ANALYSIS AND EVALUATION
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In this issue of THE JOURNAL OF ECONOMIC HISTORY are published the papers read at the Eleventh Annual Meeting of the Economic History Association.

The program was arranged by the following committee: Earl J. Hamilton, Chairman, Shepard B. Clough, Oscar Handlin, Lawrence A. Harper, Richard C. Overton, Joseph J. Spengler.

Because of lack of space in THE TASKS, additional papers on government policy as a factor in economic development will appear in subsequent issues of THE JOURNAL.

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THE JOURNAL OF ECONOMIC HISTORY

VOL. XI FALL 1951 NO. 4

ANALYSIS AND EVALUATION

The Balance Sheet of Economic Development

I

THE astute reader even of detective stories makes a practice of looking at the end of the book because the ending reveals the basic values of the book more quickly than any other single part of the whole. An audience is at a disadvantage unless the speaker furnishes some preliminary sketch of the problems to be explored and some brief answers to the questions to be examined. It is therefore appropriate to state the purpose of the paper in a few words. It is proposed to show that his torical analysis affords no support for the uncritical faith in progress that characterized most of the nineteenth century. The development of the power economy has not brought the abundance for all nor the general recognition of the advantages of world-wide freedom of trade that was confidently anticipated by idealists like Cobden.

Serious analysis of economic and social development requires substantial restatement and refinement of the concept of progress. In its early eighteenth-century formulations, the concept was hardly more than a vague belief in a process of cumulative improvement set up as an antithesis to the theological concept of the innate sinfulness of man that required some continuing manifestation of divine grace to avert disaster. Critical examination of the history of the concept is not likely to be useful until the underlying theory of invention has been more thoroughly explored. But it is now possible to revise the older position. Restatement of the concept involves primarily an adequate recognition of the distinction between growth and cumulative improvements in skill and knowledge. Novel behavior exhibits itself as modifications in

acts of skill, in discoveries of new properties in materials, and in new conceptual means of organizing individual and social behavior. All these forms of change must be distinguished from growth, whether of the individual or of the social group.

II

The concept of progress can be applied to the entire body of skills and knowledge capable of cumulative development. A progressively modified tradition is transmitted directly or by literary mediums from generation to generation. In the economic and social fields, the most important accomplishments consist of developing the arts and crafts, the whole complex of science and technology, the various systems of law, and the aspects of philosophy that relate particularly to social structure, the theories of the state, and concepts of the relation of the individual to society. Our cultures consist of skills and systems of concepts that are the result of processes of cumulative synthesis which involve very long periods of time. This process was described by Condorcet and Godwin as a manifestation of the perfectibility of the human mind, but early writers were naïve in thinking of cultural development as a natural law not dependent upon human will and effort. The emphasis upon perfectibility also encouraged extravagant ideas of a truly complete victory over the limitations of nature, and the notion of an inevitable advance was especially dangerous as it encouraged belief in the continuity of massive, meliorative improvement.

The actual accomplishment can be summarized briefly for the primary aspects of economic and social activities in the fields of the technology of production and transport. The historical period in Western culture discloses a steady development in the use of power and mechanisms to increase the effectiveness of human labor. For historical analysis, it is important to deal separately with the development of operative mechanisms and with devices for the generalized application of power.

With care, the broad outlines of the development of industrial techniques can be sufficiently established to show the essential continuity of development between antiquity and the early Christian period, and to show the need of recognizing the dependence of Greece and Rome upon technical and cultural developments in the eastern Mediterranean. Recent archaeological work has placed Mesopotamia and Syria in a position of greater importance than was previously recognized. From

the technological aspect of culture, we have achieved a much more vivid appreciation of the unity of Western civilization than was possible fifty years ago. We understand it today as a continuing process rather than as a disconnected series of episodes attributable to a few men of genius.

The outstanding developments in the textile industries occurred between 300 B.C. and 600 A.D. Notable developments in the use of water power and animal power are somewhat later. Beginnings cannot be dated with much certainty, though there is little basis for presuming that water was used for power earlier than the first century B.C. and not extensively until later. Lefebvre des Noëttes has shown that the use of animal power in antiquity was very restricted because harnesses were ill designed and the animals' feet were inadequately protected. Important advances in technology, however, were made during the imperial period. The interval between the sixth and the tenth centuries was most notable for the extensive diffusion of technical skills from the Mediterranean area to northwest Europe, but the period was not lacking in original developments in the use of both animal power and water power. From the tenth century the continuous accumulation of technical knowledge and skills is beyond serious doubt.

The extent of the development in the use of power prior to the seventeenth and eighteenth centuries has probably been underestimated because the importance of animal power was so closely associated with rural patterns of settlement that modern writers have commonly ignored its contribution to the economy. The use of power has been so largely associated with industry and with urban concentration that the extensive use of animal power in agriculture and in transportation has been taken for granted. Unless the economy of early modern Europe is compared with the economies of antiquity and of China, the contributions of animal power are almost certain to be underestimated.

Quantitative measurements of the work capacity of animals is beset with difficulties. Estimates for engineering works, however, make it necessary to have means of calculating the requirements of men and animals, so the engineering handbooks have built up tables of the work capacity of men and of the animals commonly available. Horses exert between five times and eight times as much energy as a man; but, despite the implications of the term "horsepower," horses cannot work at the rate of a "horsepower" for more than short periods of time. The work capacity of the various power devices of the earlier period may be expressed in approximate figures as follows: men, 0.1 horse-

power; bullocks, 0.3 horsepower; horses, 0.5 horsepower; 18-foot overshot water wheels, 2–5 horsepower; post windmills, 2–8 horsepower; turret windmills, 6–14 horsepower.

The substantive importance of these smaller power units can be measured both in terms of the amount of power that can be put at the command of the individual worker and in terms of the proportion of the total energy supply for the economy as a whole. The farm worker, with one or two horses, had access to as much power as a factory worker in light industry down to a late date in the nineteenth century. In Belgium, in 1910, only the metal industries, foods, and textiles averaged more than one horsepower per employee. Most of the light industry provided less than half a horsepower per employee. The craftsmen in the milling industries were provided with considerable amounts of power. At the close of the eighteenth century, the average Pennsylvania flour mill employed three workers. The largest mills would have provided about 1.66 horsepower per worker. When Oliver Evans introduced his mechanical devices to eliminate handling of the material in process, he was able to tend the mill alone, without giving it his full attention. He thus had 5 horsepower at his command. In 1910, in the United States, the flour milling industry averaged 21.6 horsepower per employee. There was thus a great increase in the power provided, but it is erroneous to presume that craftsmen of the earlier age were working without power.

The development of the coal industry and the steam engine made heat energy and mechanical energy cheaper and more conveniently available, but it was an extension in the use of power to new sectors of the economy and to new areas rather than a new beginning. The distribution of population was profoundly affected because the large use of mineral fuels made coal a weight-losing factor in production that rapidly became more important than food. It is possible now to trace the history of the use of mineral fuels in considerable detail from the early seventeenth century, though the significance of the development has still been very imperfectly worked into the body of economic history. The significance of coal is commonly underestimated for the period before 1750, and in the later period the importance of animal power and water power is rarely seen in due proportion.

Dewhurst's studies of the use of power in the United States give us a fully documented picture of the history of power in the United States. Animal power remained a significant feature of the power supply until the internal combustion engine afforded a cheaper source of power

for road transport and rural activity. In 1900, animals still provided 51.7 per cent of total power, and mineral fuels 37.8 per cent of the total.

The effective change in conditions of production is most vividly indicated by the power available per capita. In 1850, the power from all sources—human, animal, and mechanical—amounted to 760 horsepower hours per capita per year for the total population. In 1940, the power from all sources amounted to 2,200 horsepower hours per capita per year. The full significance of the change is likely to be misunderstood unless the use of power is specified by the primary categories: agriculture, industry, and transportation. The greatest increases occur in the field of transport. The magnitude of the increase can be best appreciated in terms of the power provided per passenger. For horse-drawn vehicles, the power per passenger was about 0.25 horsepower, if all the available seats were used. A coach with four horses would fall to 0.20 horsepower, if ten passengers were carried. At the present time, the railroads require three or four brake horsepower per coach passenger. Pullman service calls for about twice as much horsepower per passenger. The standard light automobiles supply up to 18–20 brake horsepower per passenger, the heavy cars up to 30 or more. The unit demand for power in transport thus greatly exceeds the unit demands in either agriculture or industry. The differences in the order of magnitude are difficult to appreciate, because the passengers are the consumers of the service and not the employees operating the service.

The increased differentiation in productive capacity between areas provided with mineral fuels and areas without mineral fuels is a source of much economic strain. It is not easy to envisage the immediate achievement of a smoothly functioning world economy in which differences in productive capacity have reached the magnitudes that have so recently become a feature of international trade. Areas without minerals are in a difficult position, and portions of the older industrial economies based on coal are subject to competitive pressures from the rise of petroleum that involve profound readjustments. The advantages of a great increase in productive power are thus qualified by localized disturbances throughout the world economy. Too many things have happened too fast. Our technology has for the moment become a kind of Frankenstein monster that we cannot control.

Furthermore, the continuance of power economy, as we now know it, requires major increases in scientific knowledge. Crude petroleum resources are not a certain source of energy, on the present scale, for much more than a hundred years. We can distill oil shales or coal, but the

reserves of these materials are not unlimited. The minerals on which our present economy is based are wasting assets. We have a time span of four hundred, eight hundred, or possibly a thousand years, but within that interval we must find some new way to utilize solar radiation directly or through vegetative processes that are continuous.

III

The bare fact that productive capacity has increased does not imply that there is any true net gain either for society as a whole or for the individual. To have more things makes life different but not necessarily better. An idealist with ascetic proclivities would doubtless be convinced that life with more things would clearly be worse. No conclusive answer can be given to the obdurate ascetic, but the validity of such a point of view is open to the gravest doubts.

It is possible to show that economic and social development has resulted in an increase in average length of life, so that there is an opportunity to make life more significant. Improvement in vitality can also be reasonably regarded as evidence of improvement in the material conditions of life.

Although a number of procedures have been suggested for the measurement of vitality, it has become increasingly clear that no index is as significant as some table of the expectation of life. For some general comparisons, short forms of the table may be adequate, and simplified methods of computation may be used, but serious analysis requires data for the expectation of life for both sexes at decade intervals from birth to 80, 90, or 100 years.

The literature on the length of life has been surveyed with careful scholarship by Dublin and Lotka, so that it is not necessary to devote space to the discussion of the statistical problems. We can confine our attention to the broader features of the record.

Accurate and comprehensive life tables can be prepared only when there is a full record of births and deaths classified by age and sex. Approximate life tables can be computed from samples that afford only lists of deaths at known ages. Sampling procedures give us some information about antiquity and the Middle Ages. Early attempts to compute comprehensive tables for particular towns begin in 1662 with the work of John Graunt on London and with Halley's study for Breslau, published in 1693. The technique was not fully developed until 1815. Development of analysis since that date has been hampered by the in-

completeness of records of births and deaths suitably classified by age.[1]

Despite the inadequacies of techniques based on small samples, these studies are important because they indicate some positive improvement in life expectancy in antiquity and in the Middle Ages. J. L. Angel has shown that there is evidence of improvement in Greece between 3500 B.C. and 1300 A.D. About 400 B.C. the expectation of life at birth was 30 years in Greece. In northern Africa, in the early days of the Roman Empire, the expectation of life was about 30 years, according to Karl Pearson. A later study of the Roman Empire by Macdonell gave a figure of 35 years for Hispania and Lusitania, 45 for northern Africa, 20 years for the city of Rome. The figure for northern Africa seems to be rather high; the figures for the provinces and for Rome itself are probably rough approximations. The difference between rural and urban conditions is highly characteristic.

It is presumed that some improvements took place in the early modern period, but materials are too inadequate to afford any accurate idea of the extent of improvement. The general changes in the expectation of life, after 1750, are best shown by the data for Sweden which are continuous and comprehensive for the whole period. Averages for males in the period 1755–1776 showed an expectation of life at birth of 33.2 years. In 1841–1845, this figure had increased to 41.9 years and in 1936–1940 to 64.3 years. Even more significant are the changes at the age of 20—36.9 years in 1755–1776; 38.9 years in 1841–1845; 49.7 years in 1936–1940.

At the age of 60, the increases were still considerable: 12.24 years in 1755–1776; 12.49 years in 1841–1845; 16.35 years in 1936–1940. Females had a slightly higher life expectancy at nearly all dates and nearly all ages.

The consequences of increasing longevity upon the age composition of a population are very great. The number of children under 15 is diminished; the proportion of the population of productive age is increased; and the number of persons at advanced ages is increased. There are many reasons for presuming that such a population would exert a greater effort in direct production, and the likelihood of greater opportunity to realize cultural values would presumably be increased. In all probability, a larger proportion of the total population would live longer and would enjoy greater opportunities for the achievement of cultural values. But it is difficult to feel confidence in the existence of any spe-

[1] Louis I. Dublin, Alfred J. Lotka, and Mortimer Spiegelman, *The Length of Life* (rev. ed.; New York: Ronald Press, 1949), pp. 32–39.

cific population pattern that could be classed as an optimum or superlatively desirable pattern. It is easier to defend the general proposition that improvement in life expectancy is desirable than to establish the unique claim of any specific pattern as the best.

Rural areas almost always show a greater expectation of life than urban areas, but it is dangerous to jump to the conclusion that rural society is better than urban society. Cultural advance has generally been favored by urban conditions, so that material disadvantages of city living are offset or balanced by greater cultural opportunities. Furthermore, no organized social life can be developed that is either exclusively rural or exclusively urban. Towns have economic and social functions essential to the activities of the region as a whole, even under conditions of maximum decentralization.

The records of the changing expectation of life also throw light upon the influence of different diets and different cultural systems upon the material welfare of various populations. The diet of the monsoon regions has been sharply criticized by the European and American nutritionists. The monsoon areas rely more heavily on vegetable fats and proteins, because the systems of agriculture are characterized by much smaller proportions of livestock than the north and south temperate cultures. Other differences in the cultural pattern between Eastern and Western civilizations are presumed by many to show the East as less progressive and less favorable to the development of material well-being. Differences in the use of power per capita lead to wide differences in productivity. Standards of material consumption are, therefore, much lower than in the industrialized areas of the Western world. Many presume that the differences in material consumption standards are an adequate index of the material conditions of life in the diverse culture areas. The records of life expectancy do not support this presumption.

We have life tables for five periods for India and for Japan based on census materials of varying degrees of accuracy. We have two series for China. The five series for India show a little improvement between 1881 and 1931, but all the series are lower than any other series of life-expectancy records published by Dublin, Lotka, and Spiegelman. The fragmentary indications of life expectancy in antiquity suggest conditions superior to conditions in India between 1881 and 1931, excepting only the city of Rome. The Roman inscriptions indicated an expectation of life at birth of 20 years. The Indian series range between a low of 22.59 years in 1911 and 26.91 years in 1931. The standard of vitality

in India may justly be characterized as the lowest standard of which we have any significant record. From a material standpoint, the cultures of India have not offered much.

The records of Japan present a profoundly different picture. The Japanese series show some improvement of life expectancy at birth. For 1899–1903, the figure was 43.97 years; for 1935–1936, 46.92 years. The lowest figure was 42.06 years in 1921–1925. But at other ages there is little evidence of progressive improvement. Infant mortality has been reduced, but there is little change in health conditions from the age of 10 years. The series are closely comparable to the series for Austria between 1891 and 1910 and for Spain between 1908 and 1923. The Japanese figures are better than the figures for European Russia until 1926–1927. Japanese conditions were markedly superior to those in Chile, Brazil, or Mexico, even as late as 1941. Venezuela and Colombia had a better record than the other South American countries, but their returns are not significantly better than the Japanese figures. In England and Wales, vitality was closely comparable to Japanese vitality in the period 1838–1890. In France, chances for survival were not better than in recent Japan until 1891–1900. Changes in vitality are less directly dependent upon standards of general productivity and consumption than upon medical care and public-health work. The improvements in public-health work did not reach the mass of the population in Japan as early as they did in Europe and North America. It is reasonable to presume that these improvements in health and vitality will ultimately be achieved in Japan.

The figures for rural China in 1929–1931 present an interesting comparison with the Japanese figures. The expectation of life was lower in China until the age of 20; from that point the rural Chinese had better chances of survival than the average Japanese, rural and urban combined. At the ages of 50 and 60, the Chinese had about as good a chance of living on as the average person in England and Wales, and at 70 and 80 the chances of the Chinese were definitely better. If these records are confirmed by more comprehensive studies, they present a very interesting commentary on the Chinese culture. The adult population required a higher proportion of young persons than the European countries, but conditions for adult survival became progressively more favorable. Study of records for Scandinavia and areas that were not intensively urbanized suggest that this phenomenon is in part characteristic of the populations that are predominantly rural. It is clear that less technological and scientific proficiency is required to maintain

adult life in rural than in urban areas. Insofar as certain cultural achievements are dependent upon urban conditions, they are made possible only by sophisticated technology, and some conditions unfavorable to survival emerge even with the best medical service. The advances in science and technology are not net gains.

IV

There are clear grounds for thinking of increases in the numbers of any organized social group as a process of growth that should be compared with the physical increase in weight of the individual organism rather than with cumulative increases in skill of the individual and of the society of which he is a part. It is a mistake to suppose that the world becomes better by reason of having a larger gross population, or that societies and states get better as they grow larger. A given society is favorably situated when its technical skills enable it to utilize its resources so effectively that it can maintain its population comfortably or provide for some modest rate of growth. It is tempting to presume that a high rate of growth is an index of more favorable conditions than a low or lower rate of growth, but it is not possible to ignore tensions and strains produced by high rates of growth. It would not be difficult to defend the position that moderate rates of growth are more likely to be favorable to society and its members than very high rates, and it is probably sound to argue that moderate rates of growth provide more favorable conditions for living than actual decrease in population. We have every reason to assume that a contracting economy is difficult and unfavorable, whether the losses are due to migration under economic or social pressure, or whether decline be due to great increases in mortality.

Although substantial statistical knowledge of the growth of population is limited to a short period, we have enough information to make it certain that the rates of growth of population have varied widely. There have been periods of rapid increase; periods of positive decline, even over large areas; and long periods of very slow increase. Knibbs pointed out many years ago that the average rate of increase of population in the world cannot have exceeded the very low rates of increase in France in the nineteenth century. But many phenomena of population growth probably fall outside the limits of such an orderly mathematical progression.

The importance of quantitative study of changes in the rate of growth

will perhaps be demonstrated most readily by brief reference to some episodes in which population declined absolutely over considerable areas. The Black Death has long been known to have exerted an important influence on the economic and social life of Europe in the fourteenth century, but we have had no trustworthy basis for any appraisal of its effect upon population until Professor Russell's study gave us a significant statistical background for estimates of population and mortality. The plague ravaged Europe as well as England; the shorter accounts usually emphasize the earliest outbreak, which occurred in England in 1348–1350, but there were four serious epidemics in England, and the disease was endemic in the intervals and for many years after the last major epidemic. Over a period of eighty years, plague mortality was so serious a factor in population growth that the total population declined sharply until about 1380 and then declined slowly to a low point about 1420. For nearly three generations this led to contraction of the economy.

Hardship and decline of population can occur as a result of economic factors alone. The population of Spain declined continuously from 1590 to about 1720, as a result of changes in the relative importance of northern Europe and the Mediterranean regions. The problem as a whole is too complex to admit of any brief summary as there are critical difficulties in the dating of the changes in population growth and uncertainties in the estimates of total population. But, for Spain, all the evidence points to positive decline in the seventeenth century. The decline of the population of Ireland after the appearance of the potato blight affords a vivid illustration of another type of adverse conditions. The great emigration was an effective mechanism of adjustment of population to new conditions. It involved less hardship than severe mortality, but it was not without economic and social costs.

Economic pressure in particular areas is frequently created in periods of active growth, because areas whose resources or geographic position are ill suited to the new conditions become distressed as a result of the change in their position in the national area or in the world at large. These phenomena are inevitable results of growth processes, so it is necessary to accept the conclusion that even positive growth, over very large areas, may produce explicitly unfavorable effects in specific regions. Growth does not proceed at constant rates, nor continuously, nor generally. Negative rates may occur for longer or shorter periods of time over large or small areas.

In all these respects, the phenomena of growth differ from the phe-

nomena associated with the accumulation of knowledge and skill. The rates of accumulation vary, but so little useful knowledge is ever lost that negative rates are unusual and not likely to be of great significance. Variations in the rate of accumulation are, thus, mainly within the limits of positive values. Periods of economic adversity are not inconsistent with notable progress in science, technology, and philosophy, though it is probably true that periods of active growth in particular regions are more favorable to great cultural achievements. So there is clear justification for distinguishing between the development of our techniques of action and the net social and economic effects of our actual behavior as individuals and as organized groups. It is desirable to restrict the concept of progress to the development of our techniques of action.

V

When we accept these limitations to the concept of progress, we are still accountable for attempting to give explicit meaning to the kinds of questions that are implicit in so many of our judgments of the past and in so many dreams for the future. Would an individual of the present day have been better or worse off to have been born in Greece in the age of Pericles or in twelfth-century England, or would he gain by waiting for another century or two? The answer can be given in statistical terms. A man of the modern age has a better chance of living longer and has greater opportunities for cultural achievement than would have been open to a Greek in the age of Pericles or to any unspecified person in twelfth-century England. Insofar as it is good to have better chances of a good life, the modern man is better off. But these statements of probability do not mean that our unspecified individual is actually going to enjoy a good life. That depends on other contingencies, partly individual, partly social. It is also possible to make statements about other possibilities. In every age, it is possible for some men to achieve the highest levels of creative activity possible to men.

Although we have very inadequate knowledge of variations in capacity and no accurate information about their distribution in a large population, we have every reason to presume that differences in capacity exhibit statistical regularities, conformable in some degree to the characteristics of the normal curve. There is no basis for presuming that the distribution of capacity is a constant—unvarying in pattern over long periods of time—but we must presume that variations in capacity

exist at all periods, even if the differences between the extremes are subject to change and even though the distribution about the mean is far from constant. Our cultural achievements are the work of successive generations of superior personalities. Our cultures consist of knowledge that accumulates progressively by the absorption of individually small items of novelty into a body of organized knowledge. Change is not an infrequent phenomenon centered around a small number of achievements of great magnitude. It is a persistent phenomenon involving many items and many personalities. The concepts of heroes and of men of genius are literary and cult devices that simplify the historical record. It is important to recognize that such accounts of historical events do not adequately represent the actual process by which we achieve our techniques and administer our affairs.

It is tempting to assume that a well-organized society should provide such a favorable environment for its superior persons that they are not obliged to waste time in struggling with inadequate facilities or with a lack of appreciation and understanding. It seems absurd to think that the Paris of the early twentieth century could do no more for the Curies than provide an abandoned storage shed for the crucial experiments on the preparation of radium. Such attitudes overlook the fact that novelties of major importance must inevitably be beyond the comprehension of even the well-trained contemporaries. The superior person must be in some degree withdrawn and detached from his immediate environment. Toynbee emphasizes this fact in his descriptions of the problems of creative leadership. The creative personality must experience periods of withdrawal, but he must also return to the social world. The ascetic misunderstands the significance of the period of withdrawal by ignoring the necessity for return. We may thus defend the position that even the good society cannot offer opportunities to the superior persons that will enable them to develop without conscious awareness of resistances. The essence of their task is to overcome resistances.

The empirical philosophy is an interpretation of a life of action in which the need of action is accepted as being at least inescapable.[2] One hesitates to say that it is necessary to accept action as itself a good. If one thinks of life as action, then it becomes clear that the essential standards of judgment are to be found in wise action and in the achieve-

[2] Carl Pribram, *Conflicting Patterns of Thought* (Washington, D.C.: Public Affairs Press, 1949). Clarence Irving Lewis, *An Analysis of Knowledge and Valuation* (La Salle, Illinois: The Open Court Publishing Company, 1946).

ment of particular ends with economy of effort. Goodness is not to be found in a condition, or a thing, or in any specific achievement; it is to be found in processes and in modes of action.

In all this, there is nothing new. The whole concept is expressed comprehensively in the words of the Hebrew prophet: "His reward was with him, and his work was before him."

ABBOTT PAYSON USHER, *Harvard University*

SPREAD OF TECHNIQUES

Italy and the Economic Development of England in the Middle Ages

I WAS asked to illustrate the effects of the economic leadership of advanced nations by an example drawn from English economic history in the Middle Ages. I have accordingly chosen the subject of Italian contribution to the economic development of medieval England. What prompted this choice was not only the contribution that the Italians in fact made but also the contribution that they are reputed to have made. Indeed their reputation for economic leadership interests me as much as their achievement. For if their reputation and their achievement are collated, something more interesting than a mere illustration of economic leadership may emerge. The illustration may well turn into a cautionary example. I hope I shall not appear immodest or perverse if I suggest that the Italian example may help to circumscribe the historical and the logical validity of the entire concept of economic leadership. For the concept that appears to mean something in historical accounts of economic forms is apt to dissolve as soon as we reach out to the fundamental forces and processes of economic growth.

It is very largely because the founders of economic history in England were so largely concerned with outward forms of economic life that it did not occur to them to cast doubt either on the ability of the Italians to lead or on the need of the English to follow. In the textbooks on which we were all brought up the problem was resolved very simply. We were told that in the earlier centuries of the Middle Ages Britain was, so to speak, on the fringes of Europe. The Anglo-Saxon conquest had wiped the slate clean of all survivals of Roman civilization. For several centuries life was to remain simple and primitive—more so than in any other European regions west of the Rhine. Cities were slow to rise and to grow; commercial contacts with the outside world were very tenuous. The country was potentially rich, but her prospective wealth was in her agriculture, especially in her wool. It was not until foreigners began to buy large quantities of English wool that England was able to start on that development which in the fullness of time made her the leading economic power in the Western world.

This development, we are told, was initiated by the Italians. The Italians came to England to buy wool, and their purchases, their loans, and their investments gave a powerful stimulus to economic life. What is more, their precept and their example taught the indigenous merchants the arts of commerce and finance. By the second half of the fourteenth century the lesson was so well learned that the teacher could be dismissed. The act of formal dismissal, as described in books, bore every resemblance to the acts by means of which in more recent times the so-called "backward" countries have tried to get rid of Western merchants and bankers. King Edward III defaulted on his vast obligations to the banking houses of Bardi and Peruzzi, and the consequent ruin of Italian merchants' houses in England enabled natives to take the place of the Italians in almost every branch of commerce and finance. The process was completed by a rapid industrialization of the country, that is, by the development of a native cloth manufacture.

This is the accepted story, and no story could have been accepted by generations of scholars without some foundation in fact. It certainly fits what we all know about the Italian economy in the earlier centuries of the Middle Ages. Compared with other countries in Western Europe, including England, Italy was wealthy; her commercial and industrial arts were highly developed; her merchants experienced and well supplied with capital. They were to be found trading in every European region west of the Rhine, and no country in which they resided or with which they traded could fail to profit from their enterprise, from their investment, and, above all, from their example of higher business technique and efficiency.

There is thus little doubt that the Italians were in a position to confer economic benefits on relatively laggard countries like England. What is more doubtful is whether the benefits were so great and continuous as to be a major factor in England's economic advance. The significant fact about England's economic progress in the Middle Ages —indeed about the economic progress of Europe as a whole—was that it was general and organic, in fact, that it was economic growth. As agricultural production increased, larger surpluses—wool and foodstuffs in England, foodstuffs and timber in eastern Europe—were available for export. As population increased, certain regions of Europe, especially the Netherlands, were able, in fact were compelled, to industrialize, and a natural symbiosis established itself between the industrial regions like Italy and the Netherlands and primary producers like England.

Growth so deeply rooted could not have been started or sustained except by forces of a simple and fundamental nature. The great agricultural development in England between the tenth century and the middle of the fourteenth, the growth of wool production in the same period, and the development of the cloth industry between the end of the fourteenth century and the fifteenth were possible only through greater supplies of labor, improved agricultural and industrial technique, and continuous investment of capital.

What part did or could the Italians have played in all this? Did they supply the additional labor? Certainly not. Did they introduce or help to introduce new economic techniques? To some degree they probably did; but how great or small the degree was will not be apparent until we have looked into the problem a little more closely. It is easy enough to show that the Italian influence on agricultural technique was insignificant. In English agriculture, technical developments were of a kind that was common to all North European nations. The change-over from intermittent cultivation to two- and later three-field systems, the employment of heavier agricultural implements and larger plow teams, the improvement in the breeding of sheep and in the quality of their fleece, all these were, so to speak, autogenous skills—skills that the people of England acquired in the course of their own struggle with their own elements. A little borrowing from other nations of northern Europe there doubtless was. It is just possible that Flemish know-how in the control of floodwaters may have percolated into the eastern counties of England, for there was a great deal of Flemish settlement there. It is also possible that the Flemish and German advances in milling technique had been learned by English millwrights. It is highly probable that the growing of vines and most vegetables was introduced into England from France. And it is certain that the arts of curing white herring and brewing beer with hops were brought from other parts of Europe. But of direct Italian influence in any of these techniques there is not a trace, and yet it was in these techniques that the greatest advances, most essential to economic growth, took place.

Almost equally autogenous was England's industrial technique. England's major industry in the Middle Ages was cloth. A cloth industry of a kind and cloth exports abroad go back to the very early English history, to the times of Charlemagne and Offa. In the great development of the cloth industry, which took place in the fourteenth and fifteenth centuries, Flemish technique and example may have played a part, though perhaps not as great a part as was once thought. The

notion that the industry was introduced to England by foreign weavers invited by Edward III is now taken for what it is, a simplification and an exaggeration. Some Flemish immigrants were invited, and more still "crashed the gate," but the main branches of the industry were in English hands and were managed by English clothmakers. The technical innovations in clothmaking introduced from abroad were, as yet, small. England, until the middle of the sixteenth century, continued to produce her traditional types of cloth—the broadcloths and rays of her southern counties, the kerseys and worsteds of her eastern counties. By far the most important, indeed a revolutionary technical innovation, was the fulling mill, and Miss Carus-Wilson has taught us to regard the introduction of the fulling mill as the turning point in the development of the English cloth industry in the Middle Ages. Together with cheap wool, it gave the English clothmaker an immense competitive advantage over the Continental clothiers and established the prosperity of the English clothmaking regions. But the fulling mill by the village stream was a peculiarly English development, part and parcel of England's social and political system in the Middle Ages, which prevented the municipal government from interfering with water-driven machinery and industrial settlement on agricultural estates.

More international in origin was the English technique of shipping and navigation, yet it owed very little to Italian example. Until the second half of the fifteenth century, the type of merchant ship that the English seamen and merchants sailed, the hulk and the cog of northern design, the sea lanes that they frequented, the methods of navigation they favored, were those they shared with other maritime nations in their neighborhood: the Dutch, the Scandinavians, the Germans. They did not build Italian galleys or carracks and did not use Italian maps. On the few rare occasions before the end of the fourteenth century when they tried to sail into the Mediterranean they were heavily punished for their audacity by the sailors and privateers of Genoa.

The only Italian example that the English imitated, both frequently and faithfully, was that of office techniques. The English merchants who sold or who bought from Italians, or who trafficked with them in foreign currency or for credit, learned from the Italians how to cover bits of parchment with business formulas, which were highly precise and universally understood. The particular form of Italian letter instructing payment abroad in foreign currency, the *tratta,* became the model for the English letter of exchange. It is possible, though

by no means certain, that the contracts of "sea loan" provided a prototype for such few contracts of English maritime insurance as are to be found in the fourteenth and fifteenth centuries. It is also probable that the English "charter party" conformed to the international usage and that that in its turn was very largely formed on Italian prototypes.

Yet even these borrowings must not be overestimated. They were mostly a matter of procedure, not of function. Long before the English merchants adopted the standard form of the *tratta,* they wrote letters instructing payment abroad in foreign currency. They often entered into partnerships with their agents abroad, even with their Italian agents, without observing the formalities or adopting the terminology of the Italian partnership contract. Throughout the Middle Ages the obligations of partners continued to be treated in English law as if they were those of servant and master, or receiver and master, actionable under the so-called "Writ of Account." The terminology, the formal correspondence, and the bookkeeping of partnerships all conformed to this legal doctrine. And so widely did the doctrine differ from that of the Italian *commenda* partnership that some legal historians unfamiliar with economic history have been led to believe that partnerships were unknown in medieval English commerce.

So much for technique. It now remains to inquire into the main and the least understood of Italian activities in England, that of investment. Evidence on this point is bound to be elusive and ambiguous. My own impression is that some Italian merchants' capital found its way into productive investment in England, but that on the whole its action was too feeble and too intermittent to make much difference to economic development.

This impression of mine is not only tentative and impressionistic but is also a composite one, for it begs at least two distinct questions: how much capital did Italians import into England? how much of the capital they imported found its way into productive employment? The first question might seem easy enough to answer. The great Italian mercantile and financial houses were very active during the thirteenth and the fourteenth centuries. Firms like the Riccardi and the Frescobaldi in the late thirteenth century, the Bardi and the Peruzzi in the early fourteenth, and the Medici in the late fourteenth and fifteenth greatly involved themselves in English finance, especially in government finance. The accumulated liability of the British Crown to the Bardi and Peruzzi in the first quarter of the fourteenth century must at times have greatly exceeded a quarter of a million pounds, a sum

equivalent to Edward III's annual war budget at its highest. Royal debts of this magnitude must, in part, have been financed out of the capital resources belonging to Italians and imported from Italy. However much did Villani exaggerate the ruin that Edward III's default brought to the Florentine houses, there is probably little doubt that some Italian investors had suffered losses and that consequently some of the money that Edward III squandered in his wars on the Continent might ultimately have come from Italian savings.

Some but by no means all, much, and at times most, of the capital that the Italians manipulated in this country came from domestic sources. It is probable that to some extent they used the deposits of wealthy Englishmen. Matthew of Paris alleges that the Jews, before their expulsion, operated with funds belonging to the great magnates. Mr. E. B. Fryde of the University College of Aberystwyth has recently described the deposits of the Dispences and of one or two other fourteenth-century families with Italian bankers. However, this was hardly a practice sufficiently general to provide the Italians with a large proportion of their loanable capital in England. Much more important to them were the funds they raised by means of ecclesiastical taxes.

The business which in the first place brought Italian financiers to England was that of papal taxation. Their involvement into royal finance often followed from their activities as papal collectors. Professor Lunt has reminded us that in the thirteenth century the popes sometimes imposed their taxes with the express purpose of financing the English kings, but even the proceeds of taxes that were destined for the papal treasury stayed for a long time at home in the hands of collectors, and it was out of these transit funds that the Italians frequently made their loans to the Crown.

The contribution which the Italian savings and imports of capital made to the royal loans in this country was thus much smaller than the vast figures of royal indebtedness might suggest. Their contribution to productive investment was smaller still. Most of the loans were made to finance royal wars, and some of the funds advanced to the Crown were paid directly to the royal officials abroad, to his army treasurers, or to his garrisons in France. Compared with these advances, the Italian loans to the king's subjects were very small. Throughout the fourteenth and fifteenth centuries we find Italians lending money to nobles and to monasteries: sometimes their loans took the form of advance payments on wool of future growth, and it is more than probable that some of the advance payments were invested in additional

flocks and new pastures. There is, however, no evidence and no reason for connecting the great development in wool production with Italian loans. The growth of flocks and the expanding area of pasture can be followed in the records of the larger English estates, but the instances of additional flocks established by loans from wool merchants, Italian or English, are very few indeed.

The story of investment in wool is merely part of the general history of agricultural investment. Students of medieval agriculture agree in regarding the twelfth and thirteenth centuries as a period of great agricultural improvement and expansion. In the two hundred fifty years between the Domesday Book and the Black Death, the acreage of land greatly increased. The number of agricultural holdings more than doubled. All this meant a vast accretion to the resources of British agriculture and represented a great new investment. But, very little, I am almost inclined to say none, of the capital thus invested came from mercantile sources, whether Italian or native. It was almost entirely created in the manner so beloved of the classical economists—by the abstinence or postponed consumption of a large number of ordinary people.

Thus the part the Italians played in economic development in England, so spectacular and conspicuous when seen reflected in the records of the countinghouses, becomes very secondary and relatively unimportant when set against the picture of national economy as a whole. Indeed, it may well be that where the impact of the Italians was most effective was neither in their direct investment nor in their lessons of higher technique, but in the part they played in helping the kings to unsettle the economic life of the country. Royal taxation and royal finance extracted from the landowning and land-working classes large amounts of wealth previously immobilized and decanted it into the hands of merchants, financiers, contractors to the armies, and war profiteers. In this way some of the wealth of the country which would otherwise have been hoarded was made available for commerce and industry.

However, much must not be made even of this. A very large proportion of the wealth thus extracted from the country was wasted on the battlefields of Europe. Indeed, the unsettlement that royal taxation and finance brought about in England's agriculture may well have helped to usher in the depression which began in the middle of the fourteenth century and was not to pass away until the end of the Middle Ages. From this point of view the Italians indirectly assisted not only

in the economic growth in the thirteenth and early fourteenth centuries but also in the decline of the fourteenth and fifteenth.

This, more or less, concludes the cautionary argument. I may well have driven it much further than I should have done had my subject dealt with the nineteenth century when capital and skill happened to be distributed among the nations of the world much more unequally than in most other periods of European history. A set of concepts, which happens to fit the relations of Britain and the Bantu in the late nineteenth century or the Americans and the Arabs in the mid-twentieth, will not help us to make much sense out of the contacts of the Flemings and the Germans in the thirteenth century or the English and the Italians in the fourteenth. But, on the whole, this was the gist of my argument. My purpose was not to raise yet another objection to historical analogies but to suggest that similarities and distinctions revealed by the study of economic forms are not strictly relevant to the study of the more fundamental processes of economic growth.

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Minority Migrations and the Diffusion of Technology[1]

I

THE process of technical change from the economist's viewpoint may be broken down into three phases: invention, innovation, and diffusion. Invention, or the increase in technological possibilities, is the discovery or perception of new configurations of technical processes or principles that alter the array of possible production functions. An innovation consists of using any given production function for the "first" time. Diffusion is basically imitative and involves the gradual replacement of old methods by the new. One example will suffice to illustrate these distinctions. The invention of the automatic bottle machine consisted of the conception, experimentation, and model-building activities of Michael J. Owens; the pioneering efforts of the entrepreneurs at Toledo, Ohio, to demonstrate that the new production function was both practical and economically feasible constituted the innovational phase; and the gradual replacement of hand-blown and semiautomatic machine methods by the new process in both American and foreign markets involved diffusion.

Like all analytical concepts, the terms "invention, innovation, and diffusion" lose some of their preciseness when one attempts to apply them to historical facts. Are advancements in "pure" science as well as their application in solving economic problems to be considered as inventions? May not the latter, in some instances, partake more of the nature of an innovation than of an invention? Should one consider an entrepreneur who borrows a special production function from foreign producers and first introduces it in the domestic economy an innovator or a special kind of imitator? It should be borne in mind that rarely is an innovation diffused in unmodified form between areas that possess different relative supplies of productive resources, different pat-

[1] I wish to acknowledge the many and stimulating discussions on this topic I have had with my colleague, Dr. William J. J. Smith, and with members of my graduate seminar (especially Messrs. Arthur J. Montgomery, Oren G. O'Neill, Richard Spangler, and Louis H. Stern). A John Simon Guggenheim Memorial Fellowship and a grant from the Bureau of Business and Economic Research of the University of California for 1948–1949 permitted me to gather the data on the French Huguenots.

terns of wants, different levels of general technical knowledge, and different institutional patterns. It seems to me that the process of transplanting new methods from one economy to another without drastic modification of the principles involved or their application should be considered as diffusion if both economies have the same culture; if they are members of different cultures or civilizations, then the initial borrowing should be viewed as an innovation and only subsequent imitations considered as instances of diffusion. The present paper is very limited in scope, not only because it concerns just the diffusion aspect or "stage" of technological evolution, but also because it focuses attention on only one method—minority migration—whereby new production functions may be diffused throughout an economy.

II

Anthropologists today appear to have lost interest in the controversy over the relative importance of parallelism and diffusion in social change. If an economic historian who is quite untutored in their discipline and relatively ignorant of their literature may be permitted to give his impression, I venture to say that, while contemporary anthropologists do not deny the possibility that specific elements of culture may "spontaneously" arise in different civilizations at various points in their history, they believe that the more normal and certainly the more frequent process of this kind of cultural change involves "tradition or diffusion in time and space." Within the same culture pattern or civilization, on the other hand, parallel inventions quite commonly occur simultaneously and independently. There is abundant factual evidence to support the view that this variety of parallelism has become increasingly important as the arts and sciences, engineering principles, and industrial technology have fused into a basic body of data for all groups within a given civilization and, more recently, for all contemporary civilizations. Even so, diffusion rather than parallelism will probably remain the much more important method whereby a civilization's or the world's level of technological practice is raised.

Exactly what is involved in this process of diffusion? How does a new invention, once adopted by an innovator, change the usual production function in any given industry or segment of economic life? The reasons *why* an economic innovation becomes diffused in an industry may readily be conceived by most economists, but few have concerned themselves with the *process* of diffusion. Taking my cue from certain anthro-

pologists, I suggest that there are at least two major routes. One I should call "diffusion by radiation" and the other "diffusion by migration." Both, of course, require a human medium. "Radiation" is at work unceasingly and almost imperceptibly and involves transmission through processes of imitation, observation, and infection through direct contact. It is somewhat analogous, at the sociocultural level, to the molecular transmission of force and pressure at the physical level. Diffusion by migration is more spectacular and violent and perhaps for this reason has impressed economic historians more strongly than diffusion by radiation. It may well be, however, that radiation is the more normal process for material and economic changes even though these probably are nearer the conscious level of imitation than are aesthetic and social borrowings. Within a civilization that has a common core of scientific and technical knowledge, diffusion of machine technology may occur rather quickly and easily without human migration when intercommunication and the means of easily transmitting knowledge are available. Processes based heavily on skills and craftsmanship may spread very slowly or, indeed, not at all, if some of the artisans do not migrate, or if outsiders do not become apprenticed to them and subsequently carry the skills back to their native land. As between advanced and backward cultures, migration may be essential for rapid diffusion, but this kind of technological change is a special case which in some respects should be considered an innovation rather than an instance of simple imitation. Migration has one characteristic that should make it very effective as a diffusion method. The hardships occasioned by breaking with one's social and cultural environment and of traveling to lands of indefinite prospects and unforeseen situations will usually discourage all but the most resourceful, energetic, and courageous. Those who have the hardihood to venture in this way hence are likely to have exactly those human qualities which are most essential to innovating and diffusing. I must confess that these remarks about "radiation versus migration" stem mainly from an intuitive bias on my part and are intended, more than anything else, to pose a problem that I hope others may be induced to study.

III

It will be useful for analytical purposes to distinguish between at least three types of migration—the individual, the group, and the minority. The individual may be a workman or an entrepreneur who

moves into a community and brings with him either the skill, know-how, or actual machines of an alien technology. Such men as Samuel Slater, John Kay, William Cockerill, William Douglas, and John Holker fall into this category. Or the individual may be a traveler—like Gabriel Jars from France, Arthur Young from England, or Canvass White (of the Erie Canal) from America—who visits foreign regions, observes the processes of some activity in which he is versed, and returns home to utilize and disseminate the knowledge he has thus gained. Individual migration has been both common and important in Western civilization, but as a method of diffusing new techniques (as distinct from inventing and innovating) it has certain limitations. Since one person is acting as the germ carrier, success or failure will depend largely on his aptitude for comprehending and communicating the observed techniques, the shortness and uncertainty of his life span, and his ability to meet the resistance of vested interests at home. Diffusion in this manner is apt to be uncertain and not very rapid.

The second type of migration, I have suggested, involves a group of individuals engaged in the same craft or in allied fields. They can establish more easily and completely the new production process and may be able to demonstrate its superiority over older processes more conclusively to native workmen than can the individual migrant. And what is of equal or greater significance, they can often transplant not only the skills and technical knowledge of the craft but also whatever institutional patterns may be associated with the new function. Economic historians will readily think of numerous examples of diffusion by this type of migration. Much of Colbert's efforts to enrich French economic life was aimed at attracting groups of lacemakers, plate-glass blowers, and fine cloth manufacturers from foreign countries. And other nations, in turn, attempted whenever possible to steal French entrepreneurs and their workmen.

The migration of true minorities constitutes the third general type. Whether the minority is isolated by religious, cultural, social, or economic barriers, it usually carries with it a whole set of institutions or a "way of life" when it migrates. The minorities whose wanderings especially have engaged the attention of economic historians, for example, have frequently transplanted new ideologies and attitudes toward economic activity as well as widely diversified technical knowledge and sometimes capital funds and even capital goods. Within the same environment it is likely that an immigrant minority group will have a more pervasive and rapid effect upon the economic life of the adopted

country than will several migrant individuals or groups associated in a common craft. I am not at all sure whether the immigration of Flemish, Brabantine, and Zeeland weavers into England during the reign of Edward III should best be considered a "group" or a "minority" movement. Coming as it did on the eve of the Hundred Years' War, it revitalized the stagnant or decaying English textile industry, apparently pioneered in capitalistic production methods, and provided some basis in the form of skilled man power and economic attitudes for the remarkable acceleration of economic growth two centuries later under Elizabeth and the first Stuarts. The fact that the immigrants were primarily engaged in spinning, weaving, and finishing woolens may provide a basis for considering them as a craft group. On the other hand, the number of people involved, the fact that they did not migrate as a group, the diversity of their skills within the industry, and the circumstances that compelled them to leave their homeland support the view that this was a true minority movement. The fact that the Low Countries by the fourteenth century were already highly specialized in weaving fine textiles would be a sufficient explanation of their common interests and skills.

Whether individuals, groups, or minorities are involved, there are numerous institutional factors that will influence the limits of efficiency for migration as a method of diffusing technology. I wish only to suggest a few at this time. Obviously, diffusion implies the transmission and incorporation of new principles or institutions into a given society. Since the American Indian economy absorbed little from the European culture but was in the end practically exterminated by it, one can scarcely consider that the colonizing efforts of Europeans resulted in much diffusion. Hence, adequate communication channels must exist if migration is to prove an efficient method for spreading technology. It will be more efficacious if the receiving country is of the same civilization and not too backward relative to the advanced area. If the immigrants hold themselves aloof and try to preserve as much and as long as possible their special ways of living, and if they refuse to impart their skills to their newly acquired neighbors, their attitude may slow down the process of diffusion although probably not prevent it in the long run. In so far as the natives are actively or even passively hostile to the immigrants, and in so far as vested interests are strongly entrenched in the economy, the communication channels so essential to imitation are to that extent constricted. The general level of education and intelligence in the host area, the geographic and occupational

mobility of its people, and the over-all density of its population will certainly influence the rate of diffusion.

Some of the most important minority migrations, at least in recent times, have represented peaceful penetration rather than military conquest. War may accelerate the diffusion of military techniques, but the very nature of coercive force in human affairs probably impedes rather than hastens the diffusion of most production functions. Barriers to effective communication and transmission of knowledge are more likely to be greater and longer lived between conquerors and conquered than between other groups.

Mention should also be made of the attitude of the state. If the government forbids immigration or so discriminates against the foreigners as to make life extremely difficult, migration may cease. If, on the other hand, the state welcomes all newcomers and grants them special privileges and economic aid, then diffusion through migration may be speeded up, provided, of course, the favoritism shown the foreigners does not evoke an even greater force in the form of public resentment pulling in the opposite direction.

IV

Thus far I have suggested that diffusion, only one aspect of technological evolution, may occur in at least two ways, by radiation and by migration, and that the latter way, although the more obvious and spectacular and also the more likely to leave distinct traces for the historian to follow, may actually be less significant than diffusion by radiation, especially as between different areas of the same civilization. I have also pointed out that a minority movement is only a special case of diffusion by migration generally. It would be impossible within the time and space allotted me to attempt a survey of the major minority migrations that have affected the technological level of Western civilization. I wish, therefore, to call attention to only two instances of peaceful penetration by minorities. The first resulted from the expulsion of Protestants from the Low Countries in the latter part of the sixteenth century, and the second followed the revocation of the Edict of Nantes in the latter half of the seventeenth century. They represent migration into areas belonging to the same civilization as the countries from which the fugitives came; with the possible exception of Prussia and other German states, the host areas were not extremely backward as compared with France or the southern Low Countries; the various governments and even the

people for a time welcomed the refugees, although considerable friction later developed between certain economic groups, and the refugees did not hold themselves completely aloof from their neighbors and, in fact, tended to lose their identity after one or two generations. All of this means that in so far as the human medium was concerned the process of transmitting ideas and of imitating practices was relatively unhampered.

Flemish, Walloon, and Dutch Protestants fled the Spanish Netherlands in large numbers shortly before and after the Duke of Alva arrived there in 1567. London included in her population over 10,000 aliens during the first quarter of the seventeenth century; Norwich had between 4,000 and 6,000 before 1600; Colchester, nearly 1,300 by 1586; and Sandwich, Canterbury, Southampton, and several other places also harbored refugees. The textile industry was further developed in the Low Countries than in England in terms of the processes utilized, the fineness and variety of the output, and the employment of capitalistic methods. The immigrants apparently affected this industry more than any other. They introduced complicated looms with multiple shuttles; caused silk manufacturing to supplant woolen and linen weaving in London; established finishing and dyeing shops so that the English no longer had to export most of their textiles to the Continent in an unfinished state; began the manufacture of a variety of textiles known as the "new draperies"; made sewing thread (called Dutchwork) at Maidstone; showed Englishmen a new method for twisting or throwing silk; began to import cotton from Antwerp in 1560; made unusually fine lace in Barnstaple and Devonshire; and helped to weaken the power of guilds on the industry by resorting to the putting-out system, by setting up shop in rural areas, and by hiring more apprentices and other workmen than the guilds allowed. Refugee glassmakers set up window-glass and crystal shops, while others promoted the manufacture of very fine writing and printing paper. The growth in the English brass, copper, iron, and steel industries was in some measure due to the skilled man power and technical knowledge of the immigrants. During the reign of Queen Elizabeth there were some hundred and fifty Dutch, German, and Flemish smiths in England working with the precious metals, and additional goldsmiths, diamond cutters, and jewelers arrived shortly afterward. The Netherlanders apparently raised the level of agricultural practice in England by utilizing manure, planting root crops, introducing several new garden vegetables, and cultivating flowers.

Holland also offered a haven to the sixteenth-century refugees. Amsterdam, Rotterdam, Haarlem, and Utrecht, in particular, benefited from the skills and the new varieties of cloth they brought with them, and the "new draperies," organized along the lines of the putting-out system, weakened the existing structure of production.

The Protestants who fled to Switzerland and Geneva during the sixteenth century were mainly French Huguenots rather than Walloons and Flemings. Refugees from northern Italy introduced the silk industry and the culture of mulberry trees; the French brought improved agricultural methods and some new vegetables, developed an important trade in velvets and silks, and began lacemaking. Even though the clock- and watchmaking industry at Geneva was already established before their arrival, the Huguenots undoubtedly helped make it the principal industry of that city.

The German states probably benefited less from this religious refugee movement than did England, Holland, or Switzerland. In the first place, since Germany was much more "backward" than these other areas, the diffusion of technology was more difficult. In the second place, such cities as Frankfort on the Main, Aix-la-Chapelle, Augsburg, Nuremberg, and Ulm repulsed the newcomers because of religious or economic friction that developed between them and the natives, while whole areas which were predominantly Lutheran or Catholic turned them away. And, in the third place, most of the refugees in Germany were agriculturalists and of the petty *bourgeoisie* or lower urban classes. Nevertheless, Hamburg, Wesel, and Cologne gained from the woolen, silk, lace, dyeing, and cloth-finishing works that were established by the newcomers, and newly founded colonies like Frankenthal and Hanau prospered.

When one considers all the evidence available at this date, one is impressed by the extent of technological diffusion for which the Protestant refugees of the sixteenth century were responsible. Although it is difficult to identify many particular industries, broadly defined, which they began in the various countries, it is clear that they introduced new branches of several industries, a variety of fine textiles which formerly had been woven exclusively in the Low Countries, and new technical devices and secret formulas. They also increased the supply of skilled labor and weakened the guild system by introducing capitalistic ideologies and methods of organizing production. It could not have been entirely fortuitous that England and Holland in particular, and Switzerland to a lesser extent, experienced a marked acceleration in

their economic and industrial growth at about the same time that the refugees were arriving.

V

The second great migration of Protestants occurred in France during the latter half of the seventeenth century as a result of events preceding and following the revocation of the Edict of Nantes (1685) by Louis XIV. It appears probable that from 1680 to around 1715 about 200,000 Huguenots fled France and settled in England, Ireland, Holland, Prussia, Switzerland, and elsewhere. This number may have been somewhat more than 10 per cent of all Protestants in France and no more than 1 per cent of her total population. The Huguenots had attained an importance in the French economy that was out of proportion to their relative numerical strength. And those who left carried with them important commercial and industrial skills as well as some liquid capital. It is my opinion, however, that they provided less of a stimulus to the English, Dutch, and Swiss economies than did the Walloons, Flemings, and Dutch refugees a century earlier. While it is true that they improved production processes and organized enterprises specializing in luxury or near luxury goods that had formerly been imported from France, they rarely established in these countries a major branch of an industry for the first time nor did they introduce more capitalistic forms of production than they found upon arrival. In Ireland and Prussia, on the other hand, the Huguenots left their greatest, or at least their most obvious, imprint.

The Irish naturalized the French refugees *en masse* as part of the program designed to attract and retain them. By 1695 there were at least twelve colonies in Ireland and by 1711 almost 10,000 refugees. They practically created the Irish linen industry. One of them, Louis Crommelin, brought over several families who had temporarily settled in Holland, imported new varieties of flaxseed, taught the farmers how to cultivate and harvest the crop, set up schools to show the women how to spin finer thread, established a broad educational program aimed at familiarizing weavers with new foreign looms, and erected bleaching houses so that most of the national output would not have to be exported in unfinished form. Consequently, exports of linen thread and cloth increased from £49,000 in 1700 to £275,000 in 1725 and to £787,000 in 1750. The refugees were also responsible for improvements in Irish lacemaking and for introducing the manufacture of silks and Irish poplin.

The Elector of Brandenburg in his famous Edict of Potsdam, issued in October 1685, offered all French refugees who would come within his jurisdiction extensive privileges and material aid. The ruler of Hesse-Cassel, the Duke of Brunswick and Luneburg, and other German princelings took similar action. Since southern Germany was still devastated and relatively depopulated as a result of the Thirty Years' War, new settlers were welcomed there. The Lutheran and Catholic areas, however, continued to view the Calvinist refugees with hostility. Since Germany, like Ireland, was still a "backward" region in 1685, the immigrants had a great opportunity to diffuse technology. They introduced the culture of mulberry trees and built the first silk mills in several cities; they made ribbons, gloves, laces, woolen and silk stockings, and fine felt hats; they even established a plate-glass factory at Neustadt; they copied some of the finer kinds of woolen textiles made in France; they improved the metallurgical and hardware trades; they perfected leather tanning; and they spread the art of printing cottons. In Prussia, in particular, they made rugs and tapestries and introduced the manufacture of gold and silk galloons. Even the French emissary at the Berlin court acknowledged in his reports to Louis XIV that the refugees were establishing all kinds of manufactures for which France had long been famous. There is good evidence that most of the enterprises continued operations even after their ownership passed into German hands. The classification of the refugees in Germany according to their trades and professions in 1700 suggests that they must have influenced production techniques in a large number of other industries which I have failed to mention specifically. Since a large portion of those who found a haven in Germany were farmers, they brought additional land under cultivation. They also introduced such crops as tobacco, artichokes, asparagus, cauliflower, potatoes, fine fruit trees, and woad. Diffusion is inherently a slow process, and Germany was unable to close completely the gap between its technological level and that of other West European countries until the nineteenth century. But most historians, including those who tend to discount the effects the Huguenots had in other countries, are unanimous in their conclusion that the diffusion of technology by them was very marked in Germany.

The effect of the Huguenots was also considerable even in the more advanced nations. Professor Lipson has called the Huguenot immigration "the third great landmark in the industrial history of England," the other two being the advent of the Flemings in the fourteenth cen-

tury and the Dutch and Walloons in the sixteenth. Although James II did not welcome the fugitives enthusiastically because of his Catholic sympathies and ties with Louis XIV, his successor William III was anxious to retain all 20,000 to 50,000 who enriched the country with various kinds of technical skill and with liquid capital amounting to perhaps as much as 900,000 gold louis. They found employment in dozens of trades which it would be pointless to list at this time. What irked the French Government and manufacturers most was the fact that the emigrants began to produce many goods of luxury quality which they themselves had theretofore supplied the English market. Silk workers from Tours, Lyons, and Nîmes settled in London and Canterbury and made damasks, "alamode" silks, lustrous black taffetas, brocades, moires, satins, and velvets which in richness of color and fineness of quality at least rivaled those exported from France. An important sailcloth factory was started at Ipswich; crown-glass and cast-plate glassworks were opened up; the secret processes involved in producing special kinds of fur and felt hats were carried by Normans to England; and calico printing benefited from the diffusion of French skill. Several entrepreneurs exported their secret methods of producing fine white paper and established mills in various parts of England. Louis XIV commissioned agents to send the sailcloth and paper workers back to France, and, although his efforts met with some success, diffusion had already gone so far that the shops and mills were reopened and operated by Englishmen. A contemporary in England wrote in 1702: "Nay, the English have now so great an esteem for the workmanship of the French refugees, that hardly any thing vends without a Gallic name." Two diplomats sent to England to negotiate a trade treaty in 1713–1714 wrote in one of their memorandums:

> It is principally since the epoch of the Prince of Orange's reign that one must report the decadence of our trade with the English. The privileges and favors which he accorded our protestants who withdrew to England in great number and who carried there our manufactories of silk, hats, hardware, paper, sail-cloth, and several other commodities have broken the usage in England of all similar imported goods which they formerly obtained from us. And they have carried the manufactories to such a degree of perfection that even we begin now to import some of their output. There is reason to fear that they may cause our manufactories to fail by offering their output at lower prices.

There is little doubt that the richest Huguenots fled to either England or Holland. Interest rates in Holland declined anywhere from 25 per cent to 40 or 50 per cent during 1680–1725; deposits in the Bank of

Amsterdam rose from an average of about 5,950,000 guilders in 1676–1680 to an average of 13,750,000 guilders in 1696–1700; and the number of depositors increased about one third between 1671 and 1701. The United Provinces welcomed all refugees and especially those who brought their own capital and industrial skills. Like the Great Elector of Brandenburg, Holland incurred the wrath and diplomatic threats of Louis XIV by refusing to allow some of the immigrants to return to their homeland. Judging by the available listings of the occupations filled by the Huguenots, it appears that they fortified the same trades and industries in Holland as they did in England. The secret reports sent to Paris by various spies, the ambassador at The Hague, and special emissaries who were supposed to persuade the refugees to return—as well as the letters of instruction mailed them from Paris—indicate that Louis XIV was most concerned about the taffeta and silk manufactories, the linen and sailcloth works, the paper mills, and the hat and glass establishments which the Huguenots had begun. Between 1681 and 1685 some 1,500 refugees had arrived at Amsterdam and had brought or built some 226 looms. The Prussian ambassador at The Hague reported in a memorandum addressed to the Great Elector in 1686:

> The prodigious success of the French manufactories, the beautiful industry of lustrous taffetas which has been judged for a long time impossible anywhere else except at Tours and Lyons, the fall in price of silk textiles which formerly sold for 50 sous and which have fallen to 36, the manufacture of beaver hats for which one formerly paid 10 *écus* and which now cost no more than 6, such are the benefits which this city has gained from its generous hospitality. . . .

Switzerland, and especially Geneva, acted in large measure as the archway through which passed some 50,000 or 60,000 French refugees. The country, however, was so small and had such a small amount of unsettled arable land and other natural resources that the various cantons felt overcrowded and tried desperately around 1700 to get other countries to receive the immigrants. For a while Louis XIV cowed Geneva with his threats of economic sanction and military force, and the city fathers were reluctant to allow any of the Protestants to settle there. I have been unable to ascertain, even approximately, how many Huguenots remained permanently in Switzerland. It appears, however, that the great majority engaged in such trades as baking, butchering, manufacturing sweets, glove- and lacemaking, printing, building, tailoring, and wigmaking or in horticulture. Contrary to the belief of many, they did not act as diffusers of technology in the clock and watch

industry but rather imitated the more advanced Swiss craftsmen. Their silk and tapestry works failed from a lack of markets. They do appear, however, to have introduced new stocking-knitting looms in Bern and Geneva and to have been largely responsible for the prosperity of the Indian cotton industry during the first part of the eighteenth century. Their greatest contributions probably were in the direction of developing Swiss finance and commerce by means of their ties with important houses in France.

VI

I have purposely avoided mentioning various Jewish movements that have been depicted by some writers as great germ carriers of technology, broadly defined. Most of the history of the Jews has been a pitiful one of penalization, outright persecution, and subsequent migration. Sombart's thesis that modern capitalism in both its ideological and its technical and financial aspects was carried by migrating Jews from Portugal, Spain, and Italy to the Low Countries and ultimately to England is familiar to all. Few writers to my knowledge have contended that the great influx of East European Jews into the United States during the last decades of the nineteenth century and the first decades of the twentieth caused any appreciable lifting of the technological level in this country, for the immigrants were leaving "backward" areas. But the new outbreak of anti-Semitism and migrations during the thirties and forties in western Europe have reawakened interest in the effects which such movements may have upon a country's technological and scientific possibilities as well as upon its level of technological practice. I confess an incapacity to evaluate at this time the supposed role of Jewish migrants as diffusers of technology, but I believe that the whole problem needs to be carefully re-examined and studied by economic historians before hazarding broad generalizations of any kind.

In conclusion, I wish to venture at least one opinion: There is little reason to anticipate that in the foreseeable future minority migrations will occasion any appreciable technological diffusion, especially as between areas of the same civilization, and this for at least two reasons. In the first place, the character of modern technology is less amenable to, and less contingent upon, minority migrations for its diffusion than is handicraft technology. Handicraft technology has usually been the type that minority migrations have diffused on a large scale in the past.

In the second place, the technologically advanced economies are not those areas which now are, or appear likely to become, centers that will expel significant minorities. The movement of the Jews from central Europe to the Near East may appear an exception to this generalization, but, if it significantly diffuses technology, the diffusion, after all, will be between areas of different cultures rather than between areas of the same civilization.

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CAPITAL MOVEMENT AND TRANSPORTATION

British Shipping and Latin America, 1806-1914

FROM the days when John Hawkins peddled slaves at the cannon's mouth along the Spanish Main, the economic potentialities of Latin America have been a perennial lure to the mariners and merchants of northern Europe in general and to the English in particular. To them it seemed almost immoral that opportunities were being wasted there that could have been exploited to the advantage of both sides of the Atlantic. As long as those monopolistic colonial systems of Spain and Portugal lasted, contacts with the British had to remain spasmodic and often outside the law. The crop of revolutions that freed Latin America shortly after 1800 at last created a maritime and commercial vacuum. The English had done much to bring this about, and they were to do even more to exploit it. The economic development of Latin America during its first century of independence was thus greatly accelerated by the efforts of the British to secure new markets for their manufactures and new cargoes for the merchantmen flying their red ensign.

British shipping constituted only one of four vital interrelated factors that gave Britain her predominant economic role in Latin America. Three of those four elements were mentioned by Lord Strangford, the British envoy to the transplanted Portuguese court in Brazil, in 1809. Commenting on British success in driving the entering wedge into those previously well-guarded preserves, he reported: "England had contented herself with the advantage she must ever derive from the magnitude of her capitals, from the more practiced industry of her manufactures, and from the great extent of her navigation." His very presence in Brazil at that time was a suggestion of the fourth element —England's head start in the field, which enabled her to "get in on the ground-floor." She had rushed cargoes to Buenos Aires after its capture by the British Army and Navy in 1806, and she capitalized Portuguese gratitude for landing their court-in-exile at Rio under naval convoy in 1808. Thereafter, the British lost no time in developing in every major Latin American seaport a phalanx of closely knit eco-

nomic activities which became so well entrenched that other nations found it difficult to gain a foothold.

No other nation could approach that fourfold advantage of capital, industrial output, shipping, and head start. Only two rivals were able to give England any real cause for concern in the field—the United States at the outset and Germany toward the end of the period.

Had it been a matter of shipping and early initiative alone, the North Americans might have gone far, for their vessels were prowling into Latin America ports as early as the British. At least one hundred twenty-five visited the Rio Plata between 1798 and 1810, and at times the Stars and Stripes outnumbered the red ensign. But the United States at that time lacked the other two elements—capital and manufactures. She herself was still dependent upon London for loans, upon Manchester and Leeds for dry goods, and upon Birmingham and Sheffield for hardware. Geographical propinquity was of aid only in the Caribbean, for south of the bulge, Rio, Buenos Aires, and the west coast were as close to Liverpool and London as to New York and Boston. Considering her high economic hopes based on the Latin American revolutions, it was somewhat ironic that for many decades the United States achieved economic primacy only in Cuba and Puerto Rico, the two colonies in America that did not break loose from Spain at that period. In the later days when the United States finally had surplus capital and manufactures for the rest of Latin America, she no longer had the requisite shipping.

The German relationship to those four factors assumed a different pattern. A few vessels from Hamburg and other German ports, to be sure, visited Latin America in the early days. But when a unified Germany was finally ready for economic expansion in the last quarter of the century, with capital, manufactures, and shipping, all operated with remarkable aggressive skill, she found the British well entrenched. Britain suffered some setbacks but was still able to retain the lion's share of the trade and navigation.

The remaining rivals suffered under still further handicaps. The Spaniards and Portuguese traded on for a while from force of habit, tradition, and established connections. No longer fortified by monopolistic restrictions, however, they were good enough neither in shipping nor in economic resources to hold their own and gradually fell far astern. The French might well have done something, for they had a fair share of all the essential factors. In Latin America, however, as in almost every other aspect of their maritime activity, whether com-

mercial or naval, the French did only enough to be reckoned among the top three or four, but they lacked the will, if not the know-how, to gain first place. The Italians had an incentive and an opportunity in the later days because of their heavy migration to Latin America, but otherwise they were not well equipped in the four requisites. The Scandinavians had nothing but shipping to offer and did little more than fill incidental needs for tramp service.

Foreign shipping of some sort was needed, for it is doubtful whether the Latin Americans themselves would have developed adequate merchant marines. Considering the vigor with which the New England Yankees and other British settlers in North America quickly turned to the sea and thoroughly exploited its opportunities, the maritime passivity of the Latin Americans seems strange. Settled in the New World even earlier than the English colonists, having ample seacoasts, and needing sea-borne contacts, they did surprisingly little afloat either before or after independence. The rigid restrictions of their colonial period may have been partly responsible, but the fact remained that, whether Creoles, Indians, Negroes, or the various combinations and permutations of those elements, they were not natural mariners and showed scant inclination to become so. A visitor from the United States who was making a survey of Latin America in 1818 italicized in his report the remark of Bernardo O'Higgins, so-called "Supreme Director" of Chile, that *"there was not a sailor to be found among all the people of Chile."*

That situation had improved little by mid-century. Such little overseas activity as did exist generally resembled the early Latin American navies, with vessels built in Europe or the United States, commanded and manned by sailors of fortune from those regions. Native mariners were completely absent in the Plata region and very scarce in the Caribbean; only in Chile, Peru, and Brazil were they in even moderate numbers.

It was small wonder, then, that if Latin America was to be linked to the outside world, the field lay open for foreign shipping. Nor did that situation change greatly with the years. In 1895 the combined Latin American merchant fleets comprised less than 2 per cent of the world's steam tonnage, with the largest of them, the Brazilian, ranking fifteenth. Although Argentina and a few others have developed rapidly in the last few years, that same general condition exists even today, if one omits the wholesale prostitution of the flag of Panama.

One of the particular reasons for Britain's success in the Latin Ameri-

can shipping competition was her early initiative in the development of the liner, as distinguished from the tramp or "transient" ship. The forerunners of the modern liner were the official Post Office packet brigs which the British Government established in the mid-eighteenth century to carry mails from Falmouth each month to various key points in the world. The British have long been alive to the value of speedy and dependable communications not only for official diplomatic and naval dispatches but also for the interchange of fresh commercial intelligence. For that purpose, they were pioneers in utilizing first sail, then steam, and finally the cable.

Whereas the tramp came and went wherever and whenever cargoes might be available, the liner sailed on a regular schedule between two or more ports. Concentrating chiefly on the carriage of mails, passengers, and, sometimes, fine freight, the liner gave a firm backbone to shipping on particular routes. It tended to channel business in the direction of the ports that it served and the flag that it flew. The liner, one might say, helped to develop new business which, in its turn, would eventually give added employment to the tramp as well. The value of regular-line service has led many governments to subsidize steamship lines while their tramp trade has generally been left to shift for itself. In Latin America, the advantages of such line service had become so apparent that some of the republics even subsidized British and other foreign lines to serve their ports.

The opening of Latin America, with its prospects of heavy trade and heavy loans, coupled with political conditions more unstable than usual, made regular communications particularly important. Within ten months after the British had landed the Portuguese court at Rio in 1808, their envoy, on specific instructions from George Canning, secured permission for regular monthly Post Office packet service from Falmouth. In 1824 a connecting branch run was established to Buenos Aires. In 1842 those two routes were still being maintained by fourteen sailing vessels at an annual cost of £37,600 to the government. By that time, however, their days were numbered.

New developments on the North Atlantic had demonstrated superior forms of service, delivering the mails even more quickly and providing far more adequate accommodations for passengers and cargo. The principle of private-line operation dates from 1818 when the first Black Ball packets began their New York-Liverpool sailings. These "square-riggers on schedule" were so successful that they soon crowded the British mail brigs from the North Atlantic shuttle. New York by 1830 had

even extended its private-packet service to the edges of Latin America, with lines to Havana, Vera Cruz, and Cartagena. The next major step was the arrival of the *Sirius* and *Great Western* at New York in 1838, marking the successful introduction of steam on a long ocean run. Sailing vessels might depart on regular schedules, but the date of their arrival was at the mercy of the winds; with steam, arrivals also became a matter of relative regularity.

The next two years rank as one of the most significant periods in the whole story of British shipping in Latin America, for they saw the creation of two steamship lines that would thereafter dominate the maritime contacts in that region and set the pattern for its whole development. One of these was the Royal Mail Steam Packet Company, chartered in 1839, and the other, the Pacific Steam Navigation Company, in 1840.

The Royal Mail was primarily the creation of James MacQueen, a Scot who, after managing a West Indian sugar plantation and traveling extensively in the Caribbean, had settled at Glasgow as an editor and publicist. In 1837 he submitted to the British Government a persuasive prospectus entitled, "General Plan for a Mail Communication between Great Britain and the Eastern and Western Parts of the World," advocating steamship lines on various key routes to be subsidized by the government. "The object being a national one," he wrote, "it ought to be carried into effect by the nation." Within three years the British Government had granted liberal subsidies to what became three of its greatest lines—the Cunard on the North Atlantic, the Peninsular and Oriental to the East, and, of immediate interest here, MacQueen's prime concern, the Royal Mail, to the Caribbean. This started with an annual grant of £240,000. Its service included a main line from Southampton to a rendezvous at St. Thomas, where mails and passengers were exchanged with the steamers of its various branch lines. The initial emphasis was on the old British sugar islands, but its routes included various Latin American ports: Havana and other Cuban stops, Tampico and Vera Cruz in Mexico, Chagres on the Isthmus of Panama, Cartagena in Colombia, and Puerto Cabello and LaGuaira in Venezuela. With £900,000 in paid-up capital, it built a fleet of fourteen steamers, averaging 1,850 tons.

The Pacific Steam Navigation Company was a smaller but much bolder venture, for its ships plied the distant and lonesome west coast of South America. Just as an Englishman, Jeremiah Thompson, had taken the lead in establishing New York's sailing packets, so an Ameri-

can, William Wheelwright, brought this ultimately great British line into being. A native of Newburyport and United States consul at Guayaquil, Wheelwright ran a line of sailing packets on the west coast for a while but soon became convinced that its light and baffling winds made the run far better suited for steam than sail.

As early as 1822, Admiral Cochrane, while commanding the Chilean Navy, had brought a little steamer to Valparaiso. Three years later, a resident of Panama named Metrovich put a pioneer steamer on the west-coast run, but fogs, fuel shortage, and complaining passengers on the maiden trip drove the poor fellow to despair. He finally fired a pistol into a barrel of gunpowder and he, his ship, the grumbling passengers, and all but one of the crew perished in the explosion.

That did not discourage Wheelwright who began in 1835 to argue the possibilities of steam navigation up and down the west coast and acquired monopoly rights from Chile, Peru, and Ecuador. He first tried to secure capital in the United States without success but finally raised £93,000—only a tenth of the Royal Mail investment—in Britain. Since his proposed Valparaiso-Callao route would not connect with England for mail service, he was not eligible for a subsidy. He built two 700-ton side-wheelers which, unlike the larger ships of the Royal Mail, could each carry 200 tons of cargo. His *Peru* and *Chile* sailed for their distant duties just as the first Cunarder was setting out for Halifax and Boston in 1840. The new service was immediately appreciated on the west coast, but the company at first encountered heavy going. That £93,000 was really "risk capital," for the line was £72,000 in the red by 1844. Skillful management soon pulled them through the critical years; a coal supply was developed in southern Chile; and by 1850 there was a 10 per cent dividend.

Before the Latin American steamship pattern was really rounded out, those two lines made three important extensions of service—the Panama arrangement in 1845, the Brazil-Plata run in 1850, and the Magellan service in 1868.

The first step, a temporary one, was made jointly by the two companies. Despite the useful linking of Valparaiso and Callao, the west coast was still badly isolated from the outside world. In 1845 Wheelwright made his line eligible for a British mail contract by extending his route to Panama. There passengers, mails, and specie could cross the isthmus to Chagres to connect with the Royal Mail's steamers for Southampton.

The second step, one of the most significant in the whole development of Latin American shipping, was the decision of the Royal Mail in 1850 to inaugurate the Brazil-Plata run. This was to be the first steam service south of the bulge. The West Indian islands, Royal Mail's original prime objective, were already starting on their long decline, while Brazil and the Plata region were on the threshold of a great boom which, with this new steam impetus, would develop the four busiest ports of Latin America—Rio, Montevideo, Buenos Aires, and, ultimately, Santos. James MacQueen had proposed a service to Brazil when the Royal Mail was taking form in 1840, but it took ten years to gain the Admiralty's approval. Meanwhile, the sailing vessels of the government packet lines, the sole survivors of the once-extensive network from Falmouth, provided the only regular contact with the lower east coast. That time-honored service came to an end when the packet *Seagull* left Falmouth on December 4, 1850, with the last regular British mails borne by sail.

Already on November 10 the Royal Mail's little steamer *Esk* had left to take up her duties on the branch Rio-Buenos Aires run; on January 8, 1851, their *Teviot* departed from Southampton with the first steam-borne mail for Brazil. Touching at Madeira and Teneriffe, she crossed the South Atlantic to Pernambuco (Recife) on the bulge and on February 7 reached Rio where the mails and passengers for Buenos Aires were transferred to the waiting *Esk*. That was a maritime landmark of the first order, and its effect was electric.

If "imitation is the sincerest flattery," the Royal Mail was immediately and strenuously flattered, for rival lines under British and foreign flags hurried into the promising new field.

Only a few of those companies serving the rich east-coast ports deserve special attention, for the French, though early in the field, were never distinctive nor were the Italians and other southern Europeans. Foremost among the Royal Mail's rivals was a great Liverpool line commonly known by the names of its original managers, Lamport and Holt. The two other most aggressive competitors in the east coast field were German—the Hamburg-South American and Bremen's North German Lloyd. They were particularly successful in developing the coffee port of Santos.

That general east-coast success was repeated on a smaller scale after the Pacific Steam Navigation Company, in the third major shift, decided in 1868 to send its ships through the Strait of Magellan to the

west coast. This rounded out the main South American shipping pattern prior to 1914. The Panama Railroad's demands for a larger share of the joint receipts in the isthmian arrangement led to this action, which had the great advantage of delivering British manufactures at Valparaiso and Callao by steamships on regular schedule without transshipment. The new arrangement, by touching at Rio and the Plata ports, had the added value of tapping the rich east-coast trade. This innovation was an immediate success; before the world depression and the "War of the Pacific" curtailed business in the late seventies, the P.S.N. had expanded to the largest steamship fleet in the world, equal in tonnage to the United States Navy of the day. Once again, others rushed in to share the profits, the most vigorous Magellan rival being the German Kosmos Line.

Even though rival lines crowded quickly into those east-coast and west-coast runs, their services represented a difference simply in degree and not in kind. In estimating the maritime contribution to the development of Latin America, the two pioneer British lines deserve full credit for their initiative in opening those vital regions to regular steamship operation. Within thirty years the vision and promotional skill of James MacQueen and William Wheelwright, and the courage of the investors who backed them, had borne rich fruit both in expanded markets for British manufactures and in the prosperity of the Latin Americans who were enabled to buy those wares from beyond the seas.

That opening of the Magellan run coincided with two new developments that shifted the prime emphasis of the liners from communications to cargo. MacQueen, in promoting the Royal Mail, had stressed rapid and regular transmission of intelligence; the first steamers of his line had almost no room for cargo because all available space was needed for coal to feed the early uneconomical machinery. The cables and the compound engine changed all that. By the mid-seventies, British initiative and capital, ever concerned with rapid communication, had linked South America to Europe by cable; no longer would the mail bags of the liners bring the freshest vital intelligence. At almost the same time the new compound engine, which the Pacific Steam Navigation had been one of the first to use, was so economical that much of the former bunker space could now be used for cargo. With the "Workshop of the World" primarily concerned with Latin America as a market for her manufactures, the advantages of regular-line service with cargo were appreciated, and the liners began to cut heavily into the former business of the "transient" sailing vessels and the newer

steam tramp freighters. While cabin passengers, as in earlier days, would continue an important consideration, this new period also saw a rapid extension of steerage facilities for the heavy flow of immigration.

As the lines began to carry more and more cargo on monthly, fortnightly, or even weekly schedules, the tramps were relegated to secondary tasks of varied natures.

From data included spasmodically in the published United States and British consular reports after the middle of the nineteenth century, it has been possible to work out a fairly compact table of the relative tonnage of the shipping under various foreign flags entering the principal Latin American ports (see Table). Because of lack of uniformity in recording local shipping movements, it has been necessary to omit vessels under Latin American flags in order to get an adequate basis of comparison for the British, United States, French, German, Italian, Spanish, and Portuguese shipping. With the tonnage figures converted into percentages, one can get a fair picture of the relative success of the different merchant marines from port to port and from decade to decade.

The continued success of Britain's red ensign is the outstanding feature in the resultant tables. Outside the Caribbean, it was almost always in first place, generally ranging between 35 and 60 per cent of the total and averaging around 45 per cent. In the case of Para, it reached a high of 91 per cent in 1897 in the interval between United States and German competition.

That long-standing British preponderance did not rest entirely upon the superior quality of the liners and tramps under the red ensign. Ship for ship, the Americans probably outclassed them at the outset, and, the Germans, in later days. The decision to employ British rather than other shipping often depended upon the long-established, well-entrenched, and closely interlocked British interests ashore—on the waterfront, in the business and financial districts, and in the hinterlands of the seaports, as well as upon the local representatives of the Foreign Office and the Royal Navy. That situation was not unique in Latin America. Americans and other outside commercial or shipping interests waxed plaintive or profane as they encountered such conditions around the world down through the years, whether at Santos, Shanghai, Singapore, or scores of other seaports.

The diplomatic aid to British penetration in Latin America was probably at its most effective in Brazil from 1808 to 1827. The British

capitalized not only their centuries of influence in Portuguese policy but also the gratitude of the Portuguese court for the Royal Navy's convoying them to Rio just as Napoleon's forces were entering Lisbon. Almost immediately, in 1808, Brazil's previously monopolized trade was thrown open to foreigners. Two years later, a commercial treaty gave Britain valuable special advantages. The Brazilians, who had not been consulted by the Portuguese negotiators, resented this, but later, after breaking from Portugal, they renewed those privileges in 1827 as the price of British recognition. The special advantages lasted until 1844.

The Royal Navy's constant showing of the flag in distant waters also promoted British interests. Only in occasional emergencies did naval forces actually intervene ashore, but their very presence had a valuable psychological effect. That is attested by occasional plaintive memorials from American mariners and merchants in Latin American ports, urging the presence of United States warships; the Royal Navy, they pointed out, was always present, and no one ever pushed the British around. The warships also served a useful role in the early days by transporting specie through the troubled waters.

But more continual than diplomatic or naval pressure were the economic interests represented by colonies of Britons-in-exile living in every port. As early as 1811 seventy-five British commercial houses had been established in Rio alongside the two hundred seven Portuguese concerns. That same year there were enough Britons in Buenos Aires to warrant the opening of "British Commercial Rooms" as a social and intelligence center with fifty-six members and a well-stocked library. The inevitable annual dinners of the St. George's, St. Andrew's, and St. Patrick's Societies started quickly. The same thing would happen elsewhere along the coasts.

On the waterfront, the Britons soon took over many such functions as docks, lighterage, repair facilities, and, later, bunkerage. By 1908 there were sixteen coaling stations in Latin America, nearly all operated by Britons and stocked with Welsh coal. That control would be turned to advantage in World War I by forcing neutrals to serve England rather than seek safer distant runs. Pressure in England's favor could also be exercised by the Lloyds' surveyors and the marine-insurance companies.

Back in the countinghouse districts, the long-established houses of British importers, exporters, commission merchants, ship brokers, and the like were often in a position to dictate what flags should carry their cargoes.

Above all, there was the elusive but all-pervasive influence of British finance, whether exercised through banks, through government loans, or through hinterland investments. Between 1815 and 1830, Britain poured into Latin America some £20,000,000, and that had almost doubled by mid-century. In 1878 the total British investment in the region was estimated at £140,000,000, most of it in so-called "London loans," but also including some 19 million in railroads, 7 in steamship lines, 6 in telegraphs and cables, nearly 4 in banks, and 3 each in mercantile firms and sheep farms. Much of this would have its influence on British shipping, if no more than in developing Latin America's economic life so that it could buy more British manufactures. Sheep or cattle ranches, copper mines, and much else could be translated not only into dividends but also into potential cargoes. Railroads played a very important part in opening new hinterland markets and sources of supply for the seaports—the influence of the British-built Saõ Paulo road upon the phenomenal rise of Santos was an outstanding example. Finally, as the nerve centers of all this economic influence, there were the great British banks with headquarters in London and branches scattered along the coast.

The North Americans felt the influence of these tightly knit British interests in many spheres, particularly in the Brazilian trade in which they felt that, as the leading consumers of coffee, they should have a generous share in its sea carriage northward. But the British developed a sort of Brazilian triangle. They shipped more wares to Brazil than they took in return, so their vessels often carried coffee to New York and there loaded North American cargo for England. The American consul at Rio wrote in 1862, "The bulk of the coffee sent to the United States is paid for by drafts on Spanish bankers, and the proceeds of the coffee, when sold, is remitted from America to London in return. This enables the English bankers and insurance agents to prohibit to a great extent, if they see fit, the carrying of coffee in American bottoms." Until 1914 much of the Rio coffee for the United States went northward under the red ensign rather than the Stars and Stripes.

Near the close of our period the interrelationship of British shipping, capital, and commerce was particularly evident in the rapid growth of the refrigerated meat traffic between the Plata and England. This was of great advantage to both regions. Britain, having subordinated agriculture to industry and being no longer able to feed her rapidly growing population, was for once primarily interested in what Latin America had to offer. British influence was strong in this new trade. As the

author of a thorough analysis of this subject has remarked, "In the River Plate region, livestock improved by the continued heavy import of British blooded animals moved over British-owned railroads to British equipped and financed plants from which the finished product was shipped on British steamships to England, for a long time the only important market."

By the outbreak of World War I, 40 per cent of the "roast beef of Old England" was imported, and 82 per cent of that beef, or one third of the total English consumption, came from Argentina, whose prosperity was thereby greatly stimulated. Though the Chicago meat packers acquired a heavy share of the Argentine industry between 1907 and 1912, the British still controlled almost all the refrigerated shipping. This, it has been said, "saved England from a very disagreeable experience in the purchase of beef" during World War I.

The outbreak of that conflict is a natural stopping point for this brief study. Thereafter, ships and cargoes from the United States began to invade Latin America, while the opening of the Panama Canal shortly afterwards meant a shifting of some of the well-established sea routes. British shipping, which had done so much to develop the region during the past century, was still in a flourishing condition. The veteran Royal Mail, with its fast buff-funneled liners "rolling down to Rio," still enjoyed a South Atlantic primacy. Its 342,000-ton total placed it fifth among the twenty-five great British passenger fleets, ahead of the North Atlantic's celebrated Cunard Line which stood seventh at 284,000 tons. Two other pioneer lines, the Pacific Steam Navigation Company and Lamport & Holt, were almost tied for tenth place at 197,000 and 196,000 tons, respectively, while the Booth Line, with a half century of success in its more restricted Amazon field, totaled 109,000 tons. Those four senior specialists in Latin American navigation represented about one sixth of the major British passenger-liner tonnage, while their £2,000,000 dividend earnings in 1914 likewise came to about one sixth of the total.

It was fitting that they had survived and flourished, for they had determined the pattern that Latin America's sea-borne contacts should take. The full contribution of such shipping to the development of the region cannot be measured statistically, but, along with the other three basic elements of capital, industry, and early head start, it had been an indispensable factor in enabling England to render real service to the region and to receive a generous service charge for her efforts.

RELATIVE TONNAGE OF FOREIGN SHIPPING ENTERING LATIN AMERICAN PORTS
(Latin American Flags Omitted)

Year	Thousand Tons	PERCENTAGE OF TOTAL FOREIGN TONNAGE					
		British	United States	French	German	Italian	Spanish & Portuguese
RIO DE JANEIRO							
1821	a	47.8	13.4	7.7	—	—	30.9
1846	373	24.0	25.6	5.6	6.3	1.8	3.1
1850	251	19.3	34.0	6.0	3.2	4.0	6.5
1880	1,155	39.8	9.6	18.9	16.0	2.2	5.1
1912	5,032	46.3	0.1	9.5	13.5	9.9	0.3
SANTOS							
1863	35	28.1	—	6.7	23.6	0.8	—
1880	277	40.5	1.6	11.4	37.2	1.5	1.1
1913	4,424	43.9	—	8.0	18.0	13.2	2.6
MONTEVIDEO							
1852	91	31.1	8.2	17.8	4.9	14.8	14.2
1854	131	14.7	16.8	14.7	7.7	7.8	28.2
1870	493	54.5	7.3	—	7.2	17.8	11.3
1878	740	43.2	4.1	17.2	11.2	12.8	4.5
1897	1,982	49.8	0.5	12.2	15.2	13.6	—
1909	6,364	53.6	0.2	10.0	21.0	7.3	3.3
BUENOS AIRES							
1822	47	41.3	32.4	8.3	0.1	2.7	—
1852	124	26.3	14.0	9.0	9.0	10.1	16.4
1871	501b	39.2	9.7	20.0	3.1	8.0	1.0
1885	1,750b	56.6	4.9	34.0	11.6	12.8	1.8
1895	2,887b	56.6	1.3	6.8	14.7	10.5	1.0
1900	2,085	51.1	0.8	11.0	14.9	11.5	4.6
1912	5,428	56.2	—	8.4	14.8	8.3	2.4
VALPARAISO							
1824c	a	59.2	34.2	1.8	—	0.9	0.9
1884	926	64.6	0.7	6.6	26.4	—	—
1894	912	64.1	0.7	6.6	27.0	—	—
1900	1,085	65.9	0.6	0.6	28.3	1.5	—
1912	1,753	50.2	0.6	3.4	38.5	—	0.8
VERA CRUZ							
1823	8	22.5	29.3	1.1	—	—	30.5
1852	43d	56.7d	14.1	13.0	23.7	1.6	8.0
1871	85	42.4	31.3	17.8	2.2	0.8	1.7
1901	908	29.2	25.6	7.0	8.2	—	20.3
1913	912	24.3	20.5	13.4	21.6	—	7.5

Year	Thousand Tons	PERCENTAGE OF TOTAL FOREIGN TONNAGE					
		British	United States	French	German	Italian	Spanish & Portuguese
HAVANA							
1849	407	16.0	49.1	1.8	3.1	——	26.0
1858	690	10.7	58.4	1.9	1.7	——	22.1
1870	763	12.6	47.3	4.9	5.5	——	23.8
1879	1,108	11.5	46.3	4.9	4.3	——	29.7
1895	1,680	12.1	39.7	2.7	1.2	——	43.4
1912	506	17.4	74.9	0.5	0.5	——	——

References: (a) number of vessels; tonnage not available; (b) all Argentina; (c) half year only; (d) tonnage of mail steamships estimated.

Figures for Rio, 1821, from A. K. Manchester, *British Preeminence in Brazil,* p. 312; for Buenos Aires, 1822; Vera Cruz, 1823; Valparaiso, 1824; and Callao, 1826, from R. A. Humphries, ed., *British Consular Reports on . . . Latin America, 1824–1826.* The remaining figures were scattered spasmodically through the annual United States *Commercial Relations* and British *Commercial Reports, Consular.*

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Britain and American Railway Development

OUR task here is to inquire into the relations between two familiar sets of phenomena—the economic development of the Western Hemisphere and the involvement of British investors, financiers, engineers, contractors, and financial groups in railways in that area. As a matter of convenience we shall look chiefly at the United States and Argentina, and at the time span of three quarters of a century preceding the First World War. It is no secret that during that period both countries underwent rapid development, whose contours included such matters as the effective occupation of new areas of vast extent; the growth of population, partly fed by immigration; the effective application of technological improvements to the exploitation of natural resources; an increasing complexity of the division of labor; and a rise in productivity and real income per capita, participated in by large segments of the population. During the same period, the Western Hemisphere was normally the outlet for from 40 to 60 per cent of British foreign investment, the United States and the Argentine being two of the countries chiefly affected. We are familiar with estimates that British investments in the United States, on the eve of the First World War, amounted to over 4 billion dollars, approximately 3 billion of which were in railway securities, and that something like half as much was invested in Argentina, with a somewhat smaller percentage directly in rails. The British owned at least three fourths of the railway mileage of Argentina and had supplied capital for most of the rest. Their railroad holdings in the United States amounted to around 15 per cent of the railroad capitalization; at earlier periods, though the amount was less, the proportion may have been as high as one fourth.

We shall not labor the advantages of improved transportation in general or even with respect to the United States and Argentina in the nineteenth century. What we want to know is what difference it made that the British invested, or built, or operated, or did whatever they did, with respect to railways in the Americas. What difference did it make that something was done by men and resources and ways of thinking and acting from a presumably more highly developed area? We should be under no illusions that this is an easy question for his-

torians or economists to answer, or that we shall be able on this occasion to do more than explore some aspects of the problem.

Commencing with the United States, we observe that British investors bought and sold our railway securities over a period of eighty years in relatively significant amounts, and that the movement and aggregate holdings fluctuated sharply.

The London market first heard of United States railways in the Jackson period, when there appeared bonds for the construction of the Camden & Amboy, Philadelphia & Reading, and Baltimore & Ohio. In the fifties, a livelier movement took place. The Pennsylvania issued shares and bonds in London to finance its expansion westward from Pittsburgh. There was capital to complete the New York & Erie and to relieve American holders of a large proportion of its securities. There were parcels of bonds, sometimes accompanied by a pledge of shares, for dozens of other railroads, West and South, mostly negotiated for the purchase of rails from British manufacturers and not always marketed publicly. Several such transactions are known only from subsequent defaults. Most of the capital went into going concerns that needed resources for completion of what had been undertaken. But English and Dutch investors, in the ratio of 3:1, allured by the land-grant feature, were drawn in almost from the start on the financing of the Illinois Central and subscribed the bulk of shares and bonds for its initial lines. Some of the early railway bonds, notably those of the Philadelphia & Reading, were convertible and became the basis for substantial stock ownership in dividend-paying lines.

The large amount of foreign investment in the United States, following the Civil War, has received much comment. In origin, this movement was more German than British and was in unregistered 5-20's and the like rather than in rails. But, from 1869, British investment in railways made a considerable feature of the total movement and, perhaps facilitated by government bond redemptions, continued for a couple of years after the panic of 1873, despite the Erie scandals and the failure of Jay Cooke to market Northern Pacific bonds. A special section of the London Stock Exchange for American rails became an established feature with a dozen brokerage firms specializing in this field. Issues in multiples of $10 millions became common, such as for the consolidation of the western part of the Pennsylvania system and its connection to Washington, for Reading's historic adventure in anthracite, and for the strategic expansion of other going concerns. Eventually recession in the United States precipitated defaults in a

large proportion of American railways, and there were a few years in which money could be raised in London only on short-term loans for the soundest companies.

But in the winter of 1879–1880 Morgan's marketed in London 350,000 of the Vanderbilt shares in New York Central. This opened a period of continuous, though fluctuating, purchase of our railway securities which lasted to the middle nineties. The movement followed closely the phases of the short business cycle and was of such proportions that it must have been an important factor in linking together fluctuations in the United States and Great Britain. The public issues of new bonds to finance extensions of the granger roads in the West, to promote new systems in the South, and to finance strategic developments elsewhere afford a highly incomplete picture of what went on during these years. A new feature was the introduction to the London Stock Exchange of the shares of twenty or thirty railroad systems and the disposal of large blocks of them in the open market by jobbers who brought them over from New York or the Continent. They were an attractive object of international speculative activity. In 1887, one half of all new securities listed in New York were listed almost at once in London. Without attempting to state maxima, I can say that foreign investors, mostly British, came during the period to own more than half the shares of Central Pacific, Chicago, Milwaukee & St. Paul, Louisville & Nashville, Wabash, and Norfolk & Western, two thirds of Denver & Rio Grande, two fifths of Pennsylvania, one third of Union Pacific, nearly all of Ohio & Mississippi and New York, Ontario & Western, besides the long-standing heavy interests in Erie and Reading and Illinois Central and a very short run stake in Sante Fe. Company-share registry lists are not likely to give us a more accurate measure of this movement. Much of it was in nondividend-paying companies, and it did not seem worth the trouble to register transfer of ownership. Large blocks of shares remained registered in the names of New York brokers.

In the course of the nineties, the London speculative market shifted its interest to gold mines in South Africa, and there was a considerable withdrawal from American rails. But active purchase of securities was renewed in the decade preceding the First World War, largely directly in New York, with relatively small offerings of sterling bonds. British war finance entailed the purchase by Americans of most of the foreign holdings in railway securities. And they played no substantial part in subsequent revivals of capital migration to the United States.

It is difficult to make any generalization about the quality or direc-

tion of these investments other than that, despite particular mishaps, they were highly profitable in the aggregate to the British investing public. Apart from New England and the far West, where large investments appear only in Central Pacific and Santa Fe, the British had a hand in several railways in every region. To a greater or less extent they had invested in all the competing trunk lines from the northern seaboard to Chicago, though perhaps least in New York Central. They were exceedingly active in coal roads like the Norfolk & Western and the unfortunate New York, Ontario & Western, and grain roads like the equally unfortunate Chicago & Great Western. London threw Gould out of Erie but, at later periods, was hospitable to Wabash and Union Pacific and even to M, K & T. There were heavy investments in sound dividend-paying companies like the Pennsylvania and Illinois Central and also in much more precarious conglomerations. The London market was catholic in its tastes.

The striking thing about all this purchase of railway securities is the small amount of British entrepreneurship, or business leadership, or control that was involved. Substantially all the British and, for that matter, other foreign investment in American railways was a supply of capital to private American companies, American promoters, American operators, and managers. Elsewhere the British have invested heavily in railways under operation of governments, as in Australia. But there is no comparable case, so far as I know, in the annals of foreign investment, of a class of entrepreneurs of one country making so continuous and successful an appeal to investors of another for a supply of capital on the unsupported credit of the prospects of companies which they, not the investors, were to control.

Now let us be clear about the nature of the point. Hundreds, if not thousands, of enterprises have been founded or operated or both by British individuals, partnerships, and companies during the century and a half of our national existence, exclusive of those assignable to British immigrants. But not railroads. Immigrants from the British Isles have of course been recruited for every kind of activity in connection with the construction and operation of those railroads. And among them there were individuals who developed careers in this country in finance, commerce, engineering, and so forth, which gave access to top management positions. But were such foreign-born railroad executives as George Coppell and John S. Kennedy, to whom foreign connections were advantageous, more creatures of those interests than Harriman who entered railroading as a representative director for the Dutch?

There are indications that fewer men of British birth rose to commanding positions in American railroads than their ratio to the general population would lead one to expect.

A list of perhaps a dozen small, local railways could be made up, which were, at one time or another, built or operated by British companies—all, I believe, in connection with land, timber, or mining interests. I can find only one railway system in the United States that was organized, operated, and expanded under the auspices of a British company. This was the Alabama Great Southern, the "Queen and Crescent" system, Cincinnati to New Orleans, put together in the late seventies under the leadership of Charles Schiff of the London house of Erlangers, who spent a few years in the United States as president. The system was disposed of piecemeal between 1800 and 1924 to the Morgan-promoted Southern and the Illinois Central. Heavy landholdings in Alabama and Louisiana were a matter of interest and profit in this connection. In this one case, British entrepreneurship played to the hilt, and fairly successfully, the role required in the American railway scene in its most hectic days.

I have found no comparable episode. The British were by no means wholly passive or mute with respect to other railway systems. From time to time they voiced attitudes and sought to make their will effective. But ownership even of a preponderant amount of stock did not carry control. In many cases shareholding was widely dispersed. There were 3,000 foreign shareholders in Erie in 1875, holding three fourths of the shares, mostly in lots of fifty or less. American managements and manipulators took full advantage of the peculiarities of share registration. Remarkably enough, American managements, despite chronic cries of dictatorship, abuse of power, and dishonesty, plain and fancy, occasionally captured an international following. So, Gowen of Reading, who was installed by McCalmont & Co.—the firm of the Scotch-Irish brothers who were Reading's leading stockholders and financial agents for forty-five years—appealed successfully for British proxies in 1882 when the McCalmonts tried to depose him.

It would be possible to catalogue a long list of activities by which British investors sought to make their will effective. There were public meetings of security holders, protective committees, selection of representative directors, missions of investigation, attempts to dictate financial policy, applications for receivership, purchase on foreclosure or reorganization, installation of management, participation in voting trusts, and there were also failures to do anything effective in each of these

respects. Hand-picked managements proceeded to act independently. The financial policies chronically clamored for—distribution of all net earnings as dividends, limitations of paying for improvements and extensions out of current earnings, or even from deficits—while frequently promised, were never satisfactorily realized. When the British clamored for perpetual debt, a compromise on hundred-year comprehensive mortgages developed. Over the years more adequate information as regards the operations began to accumulate; accounts became more standardized; and British interests achieved the innovation of independent audits by accounting firms, at the outset, British.

Short-lived financial groups were exceedingly active from 1875 to 1895 at the bedside of ailing companies. In the main their ministrations, as Brayer suggests in the case of Denver & Rio Grande, were not very satisfactory to the self-appointed physicians nor to the patients. It was the action of a London group that rid Erie of Jay Gould. But those foreign reformers had bought heavily for the rise and made it good and made reform pay handsomely for itself by paying dividends out of bond issues made ostensibly for improvements. A striking feature of reorganizations of this period in which foreign interests had a hand was the multiplication of classes of intermediate securities, whose principal function seemed to be to give investors a run for their money on the Stock Exchange without improving the ability of companies to meet their obligations or to confront financial emergencies.

In the main, these British activities were discontinuous and unconnected. That was their vice from the standpoint of entrepreneurship in going concerns. Hardly any one was sufficiently involved, or concerned, or competent to make more positive participation feasible. As time went on, however, there appeared specialists in London—a kind of professional general entrepreneur, in Cochran's terminology—who gave attention to the financial problems of several companies at once or in succession. Notably there was Robert Fleming, originally from Dundee and manager of several Scottish-American investment trusts. Fleming won the confidence of several financial groups by his sound judgment and intimate knowledge of American affairs. I have been told that he was personally responsible for the investment of more British money in the United States than any other individual.

Eventually foreign interests in American railways became so extensive and complex that they had to be consulted on every reorganization. But this situation, in fact, proved the end of their special activities regarding control. More permanent organizations than protective com-

mittees, voting trusts, and professional financial consultants were needed to pilot our railways through the treacherous shoals of conflicting and hopelessly scattered interests. Substantially, this was the opportunity for such New York investment houses as J. P. Morgan & Co., Kuhn, Loeb & Co., and Speyer & Co.—with the aid of their established foreign connections. They assumed *de facto* leadership of a cosmopolitan body of investors in which the British after 1890 became a still substantial, but not a distinctive, part.

Such ambivalent consequences for the financial position and practices of American railway companies virtually exhaust the impact of anything that can be remotely called British control upon American railway development. Systematic research may disclose qualifications. It has claimed for two different lines in the sixties that the introduction of the practice of running freight trains at night was a British suggestion. Healey has shown how early we established our own pattern of technological adjustments. For the main features of the layout, technology, and operative arrangements, I can find less British influence than our colleges and universities derived from the German and Scottish institutions.

The main British impact upon railway development in the United States, then, seems either highly obvious or remote. What is obvious is the supply of substantial quantities of capital goods, chiefly iron and steel rails to about 1890. In the aggregate, these amounted over the years to between 4 and 5 million tons. Without the latter, the pace of our railway construction could not have been maintained; each boom would have been smaller, and perhaps the total mileage would never have been realized.

It seems equally safe to say that, to maintain the pace of the capital-goods supply, a good deal of the capital flow was necessary. Without it there would have been, from time to time, strains upon our international means of payment and upon the internal disposal of our resources, which might have modified in a tangible way the historical contours of our growth. Altogether the aggregate transfer of capital was of such dimensions, amounting in some years to one half the new investment in railways construction, that it seems obvious that its stimulating effect upon the economy as a whole must have been considerable. It is true that the ratio of this movement and aggregate British holdings was low in comparison to the situation of a good many underdeveloped areas in the recent past and contemplated future. All foreign investment in the United States together could not have been more than 8 per

cent of our national wealth at its maximum point after the Civil War, and British investments in railways can never have been more than 3 per cent. We may think of our supply of capital in boom years being augmented by some 10 per cent by British railway investments. But since they were made in an industry whose growth had extensive leverage effects, we are encouraged by current trends in theory to suppose that they may have had effects that were disproportionately large. Along this line we may view the British contribution as considerable, both for the long as well as for the short run. For the latter, the case seems to be clear enough. The supply of British funds augmented the upward sweep of all the booms in which railway building figured prominently, intensified their effects for good or ill, intensified what Healey calls promotional building. Moreover, the periodic withdrawals of capital intensified the financial difficulties of recessions.

For the longer run, it seems to me that the case becomes more problematical in a number of ways. We must make a value judgment upon American development and particularly upon its pace. It could be argued that we have grown too fast, and that numerous problems of our community life, not to say the depredation of natural resources, have been aggravated by that fact. But the British did not invent the tempo of American life, our mobility, or the strains that heterogeneity have presented for the integration of our community and national life.

Indeed it would be possible to argue that the British relationship to our national growth was quite different. It could be argued that the availability of the London money market was a fact of which American promoters and entrepreneurs for decades took account as a condition, as an auspicious element in the calculation of their expectations. This, coupled with the facility with which bills on London could be drawn on short term, may have been of even more consequence than the actual capital flows.

But this availability needs in turn to be accounted for, and it cannot be done simply in terms of British superfluity. Quite early, moneyed men in London and the provinces came to expect a rapid pace for American development. And this was the solid ground for even their most speculative ventures among the Wall-Street menagerie. Can the historian safely venture down the one-way street of unilateral causation in this regard? Was not American growth as much a cause of British activity in American rails as the other way round? Was the input of British capital as autonomous and exogenous as in short-run perspective it might be taken to be?

In general, every fresh consideration of the matter has led me to the view that the relation of British effort to economic development, in the United States as elsewhere, was not automatic or certain. But I am persuaded that the relation of British investment to development was affected in the different areas in which it was applied by other institutional or, if you prefer, voluntaristic elements which must be taken into account, as well as inputs of capital, in considering consequences. For our purposes, and pending the emergence of more satisfactory theoretical analysis of these considerations, we may refer to these elements collectively as "the American scene" or the "American business environment."

We may specify descriptively some of the salient aspects of this scene: optimism as regards the long-run future; resiliency of adjustment to failure; a persistent tendency to utilize capital and credit resources to the full; a seemingly inexhaustible supply of willing entrepreneurs. Railway expansion itself was part and parcel of this scene just as were mass immigration, the conquest of the West, and the celebrated Yankee ingenuity that turned up in so many places outside of New England. For some decades British investors in American railways were alternately charmed and revolted by this scene, as creditors are always likely to be. But they were not as alien in a socioeconomic sense as nationalistic forms of problem stating tend to assume.

The Argentine episode lasted about as long as that of the United States. It did not terminate until 1947 when the eleven surviving British companies sold their local assets by negotiation to the Argentine Government for 150 million pounds—a price considerably better than the market had quoted for the securities for a decade, 38 million better than the market the week before, but about two thirds of nominal capitalization. The Argentine episode did not begin until the sixties. Then several British companies built their first sections—notably the Buenos Aires Great Southern and the Central Argentine. They built from Buenos Aires and Rosario, respectively, into the humid Pampa, an area in which several thousand British settlers, mostly Irish, had been operating *estancias* for a generation, despite the utter inadequacy of transportation for commercial exploitation of anything but wool and hides. Government, federal and provincial, also took a hand, especially in the seventies. There was also government aid variously in the way of land grants, profit guarantees, stock subscriptions, and tax exemptions. In all cases, engineers, contractors, materials, capital, and much of the labor were British.

The most rapid relative expansion came with the boom of the eighties which in its wreckage left the country with 12,000 to 14,000 kilometers of railways—about what the United States had in 1850. In the liquidations following the so-called "Baring" panic of 1890 nearly all the existing mileage, except for a couple of French-owned, narrow-gauge lines, passed into the hands of British companies, which commuted their remaining interest guarantees for down payments in government bonds. During the decade or so before the First World War there was another great wave of railway construction—this time largely by the unaided efforts of private companies. This, again, was a part of a more extensive foreign investment boom for Argentina, less disastrous than that of the eighties. The effects of its sudden termination by the war are disputed. Since that time railway expansion has been slow, with the government undertaking an increasing amount, especially in the sparsely populated regions of the far north and Patagonia. But Argentina still has scarcely more railway mileage than the United States achieved by 1870, although perhaps twice as much per capita. Substantially the British systems reached their peak just before 1914.

At that time the Argentine railway map was dominated by three British financial and management groups, which survived the collapse of the ambitious and more cosmopolitan Farquhar schemes. The pattern was long established. As early as 1890 boards of directors within and between the groups were "interlaced like Siamese twins," according to a shrewd London journalist, who thought it "a peculiarly English idea." The boards sat in London, discussed their mutual problems, made common decisions as regards wage policy, division of territory, and relations with the government, and bought the materials for new construction and maintenance. The weaker lines were salvaged without impairing the dividend-paying basis of the stronger. New financing typically took the form of issues of debentures to existing security holders without direct appeal to public channels. There were also stock dividends. But the securities were publicly listed, and considerable distribution took place. In 1947 there were 75,000 holders of the more than fifty classes of securities—not allowing for the unknown but certain duplications—who voted acceptance of the terms of the sale.

Not only all entrepreneurial decisions but the bulk of managerial opportunities were preferentially reserved for men of British nationality who found in the far-flung holdings of the dominant groups outside, as well as in, Argentina scope for careers leading for a few to seats on the boards. In 1890 we are told:

> . . . the administration of nearly the whole railway system of the country is English. There are English stationmasters in all parts. . . . The engine-drivers are nearly all English, the companies' offices are filled with Englishmen, the chief officials are of the same nationality, the clearing-house is English, nearly the whole of the imported material . . . such as rails and pot sleepers, as also the rolling stock, is English.

The employment of local engineers as department heads was commented upon as a broad-minded novelty as recently as the First World War. There were at least four hundred British technical employees in Argentina in 1947, receiving more than 1,000 pesos a month apiece, who were guaranteed five-year contracts by the terms of the sale, besides an unknown number of other employees variously paid on other forms of tenure whose continued employment was also promised. Aside from subordinate workers, Argentinians with good connections found opportunity, until recently, chiefly as figureheads on local boards of directors or in the well-paid legal departments. Such employment figured in the careers of most Argentinian ministers of public works, not to say those of other individuals of political eminence.

Thus was cemented a high degree of solidarity between the British railways and the dominant Argentine stock-raising aristocracy. This solidarity had political consequences as recently as the administration of President Justo, and it negatively affected the position of the companies in the face of the rising nationalistic clamor for industrialization. But the relation was even closer than one of advantageous compromise. Families and firms like the Robertsons, Parishes, Fairs, and Drabbles, who founded the Buenos Aires Great Southern, were identified for more than a century with British trade to Buenos Aires and themselves possessed large *estancias*. In a special sense, they were part and parcel themselves of the Argentine social structure.

The interests of these people were not confined to railways. The same directing personnel turned up in land companies, mortgage companies, packing houses, warehouses, tramways, and docks. They were interested in interlocking equipment companies in England. The railway companies themselves became involved to at least 10 per cent of their purchase price in a great variety of subsidiary enterprises in Argentina, as well as in others at home and abroad not included in the sale of assets. Until very recently all big business in Argentina had been British big business, closely tied in, although not identical, with the railways.

The impact of such a business empire cannot fail to have been tre-

mendous. But it is not so easy to appraise this impact objectively or to determine the quality of its consequences. As for the railways' share, it is clear that they really made possible the commercial exploitation of the humid Pampa and determined settlement in a more basic sense than was true of our own railways in the Great Plains. For there were few waterways, and no roads were practicable until railway transportation was extended to supplies of crushed stone. Thus the entire agricultural development of Argentina in its modern form dates from the railway era. Of political and social as well as economic consequence was the reorientation of the interior provinces from connections with the west and north to their connection with Buenos Aires. The merits of the consequent centralization and concentration of population, industry, traffic routes, and all factors in social control have been much debated. The railways made them possible. The reproach made as regards Brazil and other Latin American countries that the location of railways worked against national unity is not fully justified here. It would seem easy to adopt the view that the British really brought everything about regardless of one's degree of admiration for the way in which Argentina has developed. It has been suggested that the high wages paid British employees have, by improving the conditions of workers generally, made for a more equal distribution of national income. Proponents of industrialization, by no means all of them Peronistas, have during the last generation been markedly dissatisfied with the development of their country. And they have not failed to denounce the British railway companies as the villains.

Such criticisms as the following have been common. The lines were so located that they did not facilitate communication between interior areas except by way of Buenos Aires. They were operated substantially as unregulated monopolies. Railway rates were high; they were unresponsive to local needs; they discriminated against nascent local industries and ruined existing competitors. They actively opposed highway construction, except for feeder purposes. Employees were indifferent to passengers and shippers. There was insufficient rolling stock to handle traffic expeditiously. The companies that received land grants did not use them to promote small homesteads but held them for disposal in large blocks at inflated prices. Above all, it has been contended that capital accounts were grossly overstated, that they included a large amount of water, that the lines were built in extravagant and inappropriate ways, that London office costs were excessive, and that the companies in numerous ways concealed the size of their earnings.

The ratio of capital to traffic seemed high in comparison with North American railways. Much of the British stake did not mean fresh inputs of capital but capitalization of the resources and earning power of the country.

Much of this will seem familiar to an American historian. Some of the details suggest ignorance of railway economics and the nature of the investment process. On the other hand, there are no indications of anything resembling financial candor on the part of the British companies, either to their own investors or to the Argentine Government, even when it came to sale and the "share-out." And the criticism of their capital accounts is justified, on principle at least, when the companies adopted as a basis for the "share-out" of the 150 million pounds neither their nominal capitalization, nor market valuation, but "recognized capital" as computed by the Argentine Government.

But what has all this to do with the possible retardation or distortion of Argentine economic development? The British railways came into being as an intrinsic part of a special kind of economic system in Argentina—of which large landholdings, an economy based upon exports of staple products, the British demand for chilled meat and wheat, the immigration of unskilled labor, and the orientation of all well-bred Argentinians and those who would emulate them toward professional and political careers as against business pursuits were major characteristics. It is this whole system, from the point of view of an industrialized economy, that has tended to limit and distort Argentine development. The British did not invent the system or its parts. They did not invent large land grants or the preference of Argentinians to invest in land, to abjure trade, or to spend conspicuously abroad. But they were not so horrified at this sort of thing as so many Americans tend to be when they venture abroad. Both by the railways and by introducing technological improvements into the production, processing, and shipment of agricultural products, British investors and entrepreneurs made it possible for this system to grow and to maintain itself with apparent success and with much gratification to its beneficiaries for a couple of generations.

In this survey we have taken, as given, certain over-all differences—in the dimensions and character of development, as between the United States and Argentina—many of which are attributable to differences in resources, the scale of the economy, and time. But we have noted that there were also important differences in the function of British enterprise in the railway development of the two countries. In the United

States, British capital was used as a convenience; in Argentina it came to dominate a considerable sector of the economy. This difference in pattern I would urge is not simply a matter of the British doing the things they liked in one place and not in the other. What we observe are British investors and entrepreneurs acting in two quite different situations. There has been an Argentine scene as well as an American scene, and until lately it quite lacked the resiliency, mobility, and the disposition to perceive business opportunity and to do something about it, which were so characteristic of the American case. In neither country did the British create the social structure they encountered. Their activity aided and abetted the tendencies that were already there, and, in the case of Argentina, seemed for a time to have given them renewed strength. In Argentina as in the United States the distinctive character of British activity, I suggest, was determined in part by the fact that it took place in Argentina in a particular phase of her development.

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Great Britain and the Development of India's Railways

A STRIKING disparity exists between India's ranking as a railway power and its ranking by any other modern economic category, such as coal mined, iron and steel produced, power generated, value added by all manufacturing, or national income received per capita. Throughout the twentieth century India has had one of the world's five largest railway systems, but by most other modern categories India's economy has been among the world's weakest and least developed. I propose to begin by recounting the way in which India's railway system was developed under British leadership in the century after 1850; then I intend to turn to some possible connections between the special types of railway organization that Britain sponsored in India and the relative lack of development of other sectors of India's economy, particularly modern industry.

I

The key groups whose pressure led to the launching of modern railways in India were the great English and Scottish mercantile houses trading with the East and the smaller British merchant firms in the Indian port towns with which they were in correspondence. To these groups India's potentialities as a source of raw materials and as a market for British manufactures appeared limitless. Yet the appalling fact indicated by the statistics available in the 1840's and 1850's was that Brazil, which was not even a British colony, took ten times as much British goods per capita as did Britain's greatest colony, India. At a time when Britain itself was passing through its own "railway mania," the solution that suggested itself was obvious: India had to be covered with a network of steam railways that would link the heart of the country with the main stream of world commerce, that is, in those early Victorian days, with British commerce.

Committees for the promotion of railways in India sprang up in London, Liverpool, Calcutta, Bombay, and Madras. In the press, in pamphlets, in public gatherings, and in shareholders' meetings they

carried on a protracted controversy with the East India Company and among themselves regarding the auspices under which railways should be undertaken and the terms that would be necessary to attract British capital. Against the cumbersome administrative structure of the old East India Company the merchants and their manufacturer friends held up the virtues of private enterprise. They dilated upon the invigorating effect that the injection of modern Western private enterprise would have upon India's semi-inert society. At the same time they emphasized the magnitude of the risk involved in their proposed undertakings and demanded a governmental guarantee of profit. The East India Company, then in its last years of control in India, found many arguments against this new invasion of its domain. The British Cabinet, which had the final say, was subjected at the decisive moment to heavy pressures, including that of the City of London and other backers of the private railway companies. Finally, in 1849 the promoters, the Cabinet, and the East India Company reached agreement on terms for the construction of the first two "experimental" railways in India. (One line was to run a short distance from Calcutta in a northwesterly direction toward the Burdwan coal fields; the other line was to run in a northeasterly direction out of Bombay toward the cotton fields of the Deccan.)

The document in which these terms were embodied subsequently served as a model for many contracts under which were built the chief trunk lines of India. Without going into any detail, we may note three key features of the original 1849 contracts:

1. *Reliance on private enterprise.* The capital for these Indian railways was to be raised by private companies incorporated in the United Kingdom. These same private companies undertook to build the railways and to operate them for a period up to ninety-nine years. The Government of India retained the option of purchasing the railways from the private companies after twenty-five years elapsed. (The Government of India was the constitutional body that actually administered India from the capital city of Calcutta under the long-distance control of the East India Company and the British Cabinet.)

2. *State underwriting of the companies against the possibility of loss.* To encourage private British capitalists to invest their money in Indian railways, the Government of India agreed to certain financial obligations which devolved upon the taxpayers of India, not of the United Kingdom. The chief of these obligations, to come into effect upon the opening to traffic of each railway, provided that the Government of

India would make a contribution each year to each railway that failed to earn 5 per cent of the capital invested; that contribution was to be sufficient to enable the companies to pay a 5 per cent dividend; but the contribution was in no case to be larger than 5 per cent of each company's capital. Should the companies operate at a net loss (in which case the government's 5 per cent contribution would not be enough to assure them an annual 5 per cent profit), they were conceded the unconditional right to turn back their enterprises at any time to the Government of India. All they had to do was to give the government one year's notice, at the end of which time they would receive back their capital in full.

3. *Government of India supervision of railway operation and policy.* In return for its aid to the railway companies, the Government of India reserved to itself extensive powers over the railways: direction of line, type of construction, mode of operation, and rates and fares policy. In point of fact, however, the railway companies in practice could appeal to the British Government in Whitehall against distasteful decisions of the Government of India, and these railway companies, with their headquarters in the City of London, came to constitute a vested interest of great power.

The companies, once the initial contracts with the virtually foolproof clause guaranteeing a 5 per cent annual interest had been signed, were able to raise their capital with ease from the investing public in Britain. In 1850 the first sod was turned for the "experimental" line out of Calcutta; by 1868 more than 4,000 miles of line were open; by 1882, more than 10,000; by 1902, more than 25,000; by 1924–1925, more than 38,000 miles of first-line main track; and by 1929 some 41,000 miles were in operation. Since then there has been little change in the mileage for the subcontinent.

The total capital invested in railways—disregarding the difficulties involved in calculating this precisely and simply using the data given in the annual railway reports, converted from rupees to sterling at rates current in each of the years cited—was as follows:

by 1868 about £ 80 million
by 1882 about £135 million
by 1902 about £236 million

The overwhelming bulk of this capital was British—raised in the United Kingdom. Since later figures are not easily comparable with those just given, I shall refrain from citing them here.

The volume of freight carried by the railways rose from 12 million tons in 1869 to 15 million in 1882; 46 million in 1902; and to about 96 million in 1924–1925. A better indicator, of course, is net freight ton-miles. These rose from about 3 billion in 1881 to 9 billion in 1909, and to 21 billion in 1924–1925.

These data, however impressive they may seem at first sight, really tell us little about how well the railways have functioned or about their role in the pattern of development of the Indian economy since 1850. The fact is that for many decades the railways did not pay their way and acted as a serious drain on the finances of the Government of India. Between 1850 and 1900 the Indian Government had to advance to the railway companies, in order to enable them to pay their shareholders 5 per cent dividends, a total sum of £50 million. In general, it is not too much to say that, except for the shareholders, virtually no one acquainted with railway matters has been pleased with the way they have functioned. From a comparative point of view this public attitude toward railways may not be a novelty, but the grounds for it in India seem to me to have been somewhat different from those which have operated elsewhere. Chief among these grounds, in addition to the question of unprofitability—that is, up to 1900, for since then the railways by and large have paid their way—were the poor quality of the freight service, rates and fares policy, the failure to develop industries in India capable of supplying the country's needs for railway equipment and stores, the exclusion of Indians from executive posts on railways during their first seventy-five years of operation, and the fact that right down to our own day vast areas of the country have been left without any railway service whatsoever.

These persistent basic difficulties were so great that they provoked a major governmental inquiry into Indian railway affairs in virtually every decade from the 1850's to the 1940's. The theme around which these inquiries centered was whether private ownership and private management of the railways was the form of organization best suited to Indian conditions, or whether some alternative type of organization would prove financially more remunerative to the Government of India and also render greater service to India's economic needs.

During the century since 1850 the pattern of development of railway ownership and management in India did not remain uniform but passed through four main phases. The first phase, comprising the two decades from 1849 to 1869, was that of the original guaranteed-interest system. Under it, all the capital for the railways was privately raised

(99 per cent in Britain), and all the lines were privately owned and operated. With a sole exception, the East Indian Railway from Calcutta to Delhi, none of these lines earned enough to pay 5 per cent dividends. Therefore the Government of India had to advance money under the terms of the contract to enable them to do so. By 1869 these advances totaled about £15 million. Since these sums were so large, and since the private companies seemed to be relying more and more upon them rather than trying to raise the level of their own net earnings, the private-company system became discredited. The Government of India sought at that time to end the entire guarantee system by buying out the private companies and inaugurating a policy of thorough-going state ownership and operation.

In London, however, the Secretary of State for India was unwilling. He supported the Government of India only to the extent of agreeing that *new* railways from 1870 onward were to be state-built and state-operated. Simultaneously, however, and without consulting with the Government of India, the Secretary of State renegotiated the older contracts with all the private companies, except the East Indian Railway, on terms even more favorable to them than before. This was done with the avowed aim of stimulating the companies to more genuine enterprise toward earning their own way.

For the decade from 1870 to 1880, the second phase of railway development, the two types of organization functioned side by side: on the one hand, the older private companies owned and operated the trunk lines; on the other hand, new auxiliary lines, built and run by the Government of India, came into operation. The latter started out auspiciously. The state lines were as well built as the private lines, and they were as well run. In fact, their costs of construction were much lower than those of the private companies. Despite this good showing, the first large trial of state operation soon foundered on the rocks of public finance. To build, own, and operate railways, the Government of India needed to raise large sums of capital. But just at this time several large new financial burdens pressed upon the Government of India. In the first place, the worst series of famines in a century afflicted great parts of the country and necessitated large expenditures. In the second place, the Government of India got itself involved in an unprofitable and expensive war with Afghanistan. Opponents of state railway operation took advantage of these difficulties to argue that the government could not be depended on to raise money for railways, that this was not a proper sphere for governmental activity, and in any

case private enterprise could do a better job. As support for these arguments they cited the case of the East Indian Railway. Here was India's first, most important, and most profitable railway, flourishing under private operation. Its directors and shareholders, for reasons that we cannot go into here, had refused to go along with the other railways when their contracts were renegotiated in 1869. Under the terms of the original contract between the Government of India and the East Indian Railway, however, the government had the option in 1879 of taking over the line. The decisive question in the late 1870's, then, was which type of policy would prevail in this crucial case. A new contract was signed in 1879 which embodied a compromise between the Government of India and the backers of "private enterprise"; in it the advantage lay with the latter. Shortly thereafter the Secretary of State for India instructed the government to bring to an end its trial of state operation, except on military lines.

These instructions, together with the new East Indian Railway contract, inaugurated the third period in the railway development of India, the period of the modified guaranteed-interest system, 1880–1924. In the broadest terms, this contract of 1879 signified a change from private ownership and private management to overwhelmingly public ownership combined with a peculiar type of private management that was subject, especially in matters of railway financing, to great governmental restraint. The original East Indian Railway Company was purchased by the state, and 80 per cent of its shareholders were bought out, principally by annuities. Under the new contract the remaining 20 per cent of the shareholders in the original East Indian Railway who were not bought out formed a new company. They kept the old name of the railway and contracted to manage the undertaking. For this they were guaranteed, out of the revenues of India, 4 per cent on their capital. Should surplus profits remain in any year—after working expenses, annuity sinking-fund payments, and interest on loan capital, and so forth, had been met—the private owners of stock in the "new" undertaking would share in these surplus profits. Since the state was now the principal owner of the railway, the lion's share of such surplus profits would naturally go to it. The private companies retained in their own hands the control of the most significant aspect of railway operation, the setting of rates and fares. By and large they also continued to exercise the right to purchase equipment where they pleased and to staff the lines with whom they pleased.

This 1879 contract with the East Indian Railway provided a rough

model that the government followed in dealing with the other main lines of India as their first twenty-five-year period came to an end and the government had the right to buy them out. It is not surprising that under the revised and renewed contracts there was little impetus to efficient operation. After all, the private shareholders were guaranted their 4 per cent. If any surplus profits did accrue, the overwhelming bulk was bound to go to the state. So the managers of these undertakings did not tax themselves unduly. Their jobs were well-paying; they were important figures in the India of their day, controlling the inland transport of the country and wielding the considerable economic power that went with such control.

But in one sphere their hands were tightly tied. They could not make a move in the sphere of capital expenditure on railways without the consent of the Government of India. The new railway companies managed their lines on behalf of the government, but, in allocating their receipts from railway operation, they were strictly subordinate to the Finance Department of the Government of India. The result was that the railways never knew just where they stood on capital expenditure for development and extensions or, in the language of the Acworth Committee of 1920–1921, "even for the essential operations of renewal and repairs." For the primary duty of the Finance Member of the Government of India was to balance his budget, and often the most convenient way to do so was at the expense of the railways. In a classic passage the Acworth Committee put it as follows:

> In times of bad harvests and bad trade, receipts fall off. The Finance Member is constrained to economize. He cannot reduce the army or the civil services wholesale at short notice. Nor can he refuse to pay railway wages or to provide currently consumable stores. He can and does curtail his appropriation to railways for renewal and betterment works. And he cuts down still more drastically expenditure on new works and extensions, even though they may be in process of execution. . . . The effect of this policy of inadequate allotments, varying irregularly up and down from year to year, would have been bad enough in any case. But it is made worse when, as not infrequently happens, the allotment is suddenly cut down during the currency of the year to which it relates, and works in progress are suspended, staff are disbanded at a moment's notice, and materials are left lying on the ground for an indefinite period. An almost equally bad effect is produced when late on in the year the Finance Member with equal suddenness lifts his hands and thus encourages the railways to spend freely. For then, in fear of the guillotine of "lapse" which must descend [at the end of the fiscal year] on 31st March, in eager haste the railway officials start to spend, with inadequate staff and hurriedly collected materials, the money unexpectedly thrust on them.

Under this curious system of financial control the Indian railways suffered from serious undercapitalization. The existing lines did not provide sufficient service to move the traffic that presented itself. Chronic congestion became a normal condition before the close of the nineteenth century.

Further, the country's total railway network remained much too thin. In his comprehensive *Report* of 1903, Thomas Robertson declared flatly that India was insufficiently provided with railways, and he urged that more rapid progress "be made in their construction, so as to open up the large tracts which are now entirely deprived of suitable means of communication." Discussing this same subject in 1908, when about 33,000 miles of railway were open, the Mackay Commission held that India needed a network three times larger, a full 100,000 miles. Writing in 1921, the Acworth Committee, most important of the many commissions of inquiry that have pondered the problems of Indian railways, declared:

> How much the economic development of India has suffered, not from hesitation to provide for the future—no attempt has been made to do this—but from the utter failure even to keep abreast of the day-to-day requirements of the traffic actually in sight and clamoring to be carried, it is impossible to say.

In addition to these disastrous effects of undercapitalization, the economic policies of the railways restrained rather than facilitated the indigenous economic development of India, that is, the economic policies of the railways retarded the economic changes that the very existence of the railways made possible. From their first decade of operation in the 1850's down to the years of World War I, the dominant tendency of the Indian railways was to carry a relatively small volume of traffic at relatively high rates rather than a relatively large volume of traffic at relatively low rates.[1] The Government of India could never

[1] In this connection it is important to distinguish between the absolute level of Indian railway rates as compared with other countries and the level at which Indian rates might have been pitched had the companies pursued a different kind of rate policy, say a policy designed to attract and develop a maximum volume of traffic. Thus when the Acworth Committee asserted: "Indian railway rates and fares have always been among the lowest, if not actually the lowest in the world," this statement should be compared with that in the *Report* submitted by Thomas Robertson two decades earlier: "The Fares and Rates charged in India, judged from the standpoint of the actual money payment made, are considerably lower than those charged in England; but for a comparison to be of any value, consideration must be paid to the circumstances of the two countries. Taking the cost of construction and working in England and comparing them with the cost of construction and working in India, and in every other respect if like is compared with like, I think it will be found that the rates and fares in India should, broadly speaking, be only about one-sixth of those in England."

quite persuade the railways that rock-bottom rates would greatly increase the total volume of traffic and swell the companies' own total revenue income and net profits.

The nonchalant attitude of the railway companies toward the question of developing a really large-scale traffic in the country sprang primarily from their knowledge that the interest guaranteed by the Government of India could always be relied upon to enable them to pay a dividend. Although the Government of India exercised considerable control over the *physical* operation of the lines, it was compelled, at the insistence of Whitehall, to leave the railway companies a remarkable amount of latitude in framing their *economic* policy. Each company followed its own "individualistic" policy in setting its rates structure—rates for shipments were not quoted on a "through" basis (no matter how many lines a consignment traversed) but as separate rates for each company's line. Shippers were treated, by and large, on a take-it-or-leave-it basis. As each railway had a practical monopoly of rail service for the bulk of its territory, most shippers had no choice but to adjust themselves to this attitude. (Exceptions to this were found in those limited areas, especially in northern India, served by several lines following alternative routes to the great seaports of Calcutta, Bombay, and Karachi; such limited areas had the benefit of repeated rate wars among the trunk lines passing through them.)

Thus, for example, shippers of coal from the mines 180 miles northwest of Calcutta could never know whether their shipments would move to the seaport at rates of eight, six, four, or even two miles per hour. In his special *Report,* Thomas Robertson commented, in 1903, that the principal delays were due not to the speed at which the goods were timed to travel but rather to an incredible number of delays in starting, at intermediate stations, and at junctions en route. His *Report* recommended that, "by increasing the speed at which goods are now carried to twice the present average, a railway would immediately increase the work done by its rolling stock 100%, less the time taken to load and unload the second consignment, and could thus carry the same traffic as it now carries with half the stock necessary under present conditions, . . . and it could do all this without any increase in the running speed of its trains. If, at the same time, the running speed of the trains was raised, the amount of work which could be obtained from the rolling stock would be still further increased."

Operating at this level of efficiency meant that at the busy season railway wagons would be in short supply. Harassed shippers found that

to obtain wagons when they were needed most they had to offer inducements to subordinate railway personnel. By 1921 this practice had grown to such proportions that the Acworth Committee roundly condemned it as "a system of organized blackmail."

On the executive levels, the Indian railways functioned as a purely British show. The Acworth Committee summed this up neatly in 1921: "there were employed on the railways of India about 710,000 persons; of these, roughly 700,000 were Indians and only 7,000 Europeans, a proportion of just 1 per cent. But the 7,000 were like a thin film of oil on the top of a glass of water, resting upon but hardly mixing with the 700,000 below."

When the first railways were built they were naturally equipped with British locomotives and rolling stock. Thereafter, as a matter of course, the managers of India's railways continued to order their equipment, spare parts, and miscellaneous items from Britain—not only those items which were not available in India but also, right down to the 1920's, items that were, or could be, made in India. Indian businessmen never reconciled themselves to this stores purchase policy.

The many defects of the older system, the modified guaranteed-interest system, had been patent for at least two decades before the Acworth Committee was appointed in 1920. What pressures to end the system were there in 1920 that were not in existence in 1900? The evidence submitted to the Acworth Committee provides the answer. The conditions to which Indian passengers and traders had long been subjected, they observed, had deeply and justifiably incensed the Indian public. The unfortunate customers of the Indian railways, however, had nowhere else to turn. They merely suffered. "They are ceasing to suffer in silence." It may be recalled that this description was written by the Acworth Committee in 1921 at the time that Gandhi was leading the Indian National Congress' first Civil-Disobedience Campaign of 1920–1922. Indian public opinion, according to Acworth, was "practically unanimous" in demanding that the state take over the actual management of the railways. In framing new arrangements it was essential to bear this in mind, for it was "of the utmost importance that Indian public opinion should not be prepossessed against the [new] railway management."

Sir William Acworth himself, the leading British railway economist of his day, was known to be generally in favor of private as against state railway management. Nevertheless, in making recommendations for the future of the Indian railways, Acworth saw no practicable alter-

native to complete state ownership and state management on the basis of the separation of the railway budget and finances from the general budget and finances of the government. He was supported in his recommendations by two other English members of the committee and two Indian members.

The five members of the Acworth Committee who were in favor of the continuance of some form of *private* management also conceded that public opinion was against them. The public, they stated, favored state management because it believed that company management based on boards of directors in London "does not encourage the development of indigenous industries by sufficiently favorable treatment; that it gives preferential treatment to import and export goods; that under the present system of company management large profits are made by British interests; and that hitherto the companies have not employed Indians in higher appointments except to a very limited extent, and have not granted them adequate facilities for technical training."

Three years after the publication of the Acworth *Report* the Government of India bought out the East Indian Railway and placed it under complete state ownership and management, thus inaugurating the fourth phase of Indian railway organization. Thereafter the government took similar action with every other significant line. This policy of state management prevails today in both India and Pakistan. During World War II the British capital invested in the railways was repatriated. Today the lines are both indigenously owned and indigenously operated.

II

We may now turn to the broader question of the place occupied by the railways in the pattern of Indian economic development during the last one hundred years. Although major innovations in law, administration, irrigation, public health, and education accompanied the introduction of railways, the impact of the railways was the sharpest and the most far-reaching.

In the economic sphere the railways fostered a measure of regional specialization in both agricultural and industrial production and encouraged the bringing of more land under cultivation. The railways appear also to have helped raise the level of prices and wages and to have helped make them more nearly uniform in the subcontinent as a whole. Yet when we consider the fact that the railways have been the

largest and most important enterprise of a truly modern character in India, involving heavy machinery, precision techniques, and advanced communications, we have to conclude that they have had surprisingly few *constructive* results. They helped spread a veneer of modernization over the countryside while doing little to initiate a process of genuine modernization.

The query may be raised, in fact, whether the railways have been more of a destructive than a constructive innovation in India. There can be little doubt that the railways have played an important part in eroding the pre-nineteenth-century structure of India's society and economy. We can characterize that older structure as one in which the typical unit was the self-subsistent, but not egalitarian, village community. From such villages the political ruler of the region took, often indirectly, a significant share of the village crops. Private property rights, to the extent that they existed, were not so much in land itself as in shares of the crops. By now that society has broken down almost completely. In vast areas, the older style village communities have been dissolved. They have been replaced not by urban or industrial centers but by village units in which the dominant forces are rent-receiving landlords (typically absentee), aggressive moneylenders, and crop merchants. The bulk of the rural population has come to consist of dependent tenants and landless laborers. These groups now function within an increasingly market-oriented structure and in terms of highly developed concepts of private property in land. Meanwhile the basic modes of cultivating the soil, the tools and working methods, remain fundamentally unaltered. And agriculture continues to provide the chief means of subsistence for the overwhelming majority of the people. Further, total population having increased by at least 150 million in the last hundred years, the amount of land available per family has shrunk, and yields per unit of cultivation, at least in the last fifty years, have remained constant or have dwindled. Such conditions are far removed from those of a "modernized" society!

The question which we now have to consider is whether these conditions were bound to occur automatically and inevitably, once the railways were introduced, or whether an alternative railway policy might have had more constructive consequences. Was there another way of providing India with railroads, a way that might have led toward a process of genuine development? As an abstract possibility, the answer is in the affirmative. The elements of such an alternative policy may be stated here in bare outline:

1. Begin with lightly built railways and adhere to a single gauge, preferably not of the expensive broad-gauge type; rebuild on a heavier basis only as the pressure of traffic compels it; forego stations in the grand style and luxury coaches.

2. Encourage a heavy volume of traffic by charging low rates and low fares; in all likelihood this should lead to highest gross income and to net profits at least as great as under a relatively high-rates and high-fares policy; draw on profits for rebuilding of busiest sections.

3. Avoid the policy of exceptionally cheap rates between ports and interior; in a country like India, where dependence on a few great port towns is undesirable, a policy of special rates from one part of the interior to another part of the interior might be more suitable.

4. Keep equipment needs relatively low by covering the country with a network of interlinked lines so that equipment could be shifted from one part of the country to another as the local busy seasons occur.

5. Raise as much capital as possible locally, rather than rely completely upon abroad with the resultant foreign exchange and other complications.

6. Develop a training program so that in time indigenous personnel could handle all levels and types of railway work.

7. Obtain locally as much equipment and stores as possible; encourage the growth of indigenous iron and steel and machinery industries, at least by preferential railway rates and perhaps with other forms of governmental assistance as well.

8. Lastly, experiment from the beginning with more than one type of railway organization. Compare the results under public ownership and operation with those under private and semiprivate auspices. If one type demonstrates convincing and sustained superiority, scrap the others.

The mere listing of these eight points indicates at once why Great Britain could not possibly have followed such a course of railway development in India. A British Cabinet that tried to implement such policies would have been turned out of office. Government of India officials who pushed for one or another of these points—and most of them were in fact put forward between the 1850's and the 1880's—found the going very heavy. After all, the prime concern of British railway policy in India was to make India useful to Britain, not to make Britain useful to India. It was India that was the colony of Britain, not the reverse. Leland Jenks hit the nail on the head when he argued in 1927 that one could almost say that no Indian economic system existed;

rather, economic activities in India were simply an organic portion of the British economic system.

India's actual experience with railways, in short, demonstrates how a great railway network can coexist with a "backward" agricultural economy—provided we understand (1) that the network is great primarily in its length and is "underdeveloped" in many other basic respects, and (2) that the economy of India is "backward" not so much in an eighteenth-century sense as in a twentieth-century or "modern" sense. India is not what it used to be, nor is it what leading Indians today want it to be. It is perhaps the outstanding example of a modern-style underdeveloped economy.

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POPULATION

Notes on France's Response to Her Declining Rate of Demographic Growth

FOR at least three quarters of a century the Devil of Declining Growth has been present at French council tables, at policy-making conferences, and in the minds of strategically situated decision makers. The Devil has not always been present in the flesh, since that is not the way of devils. But he has always been at the shoulders of the holders of power, and they have usually taken him into account implicitly when not explicitly.

I

The movement of France's population between 1801 and 1936 is susceptible of terse summary. In this interval the French population increased by 52 per cent or 13.7 million, moving from 27.5 to 41.2 million. Of this increase, 77 per cent took place in 1801–1866, and 3.1 million or 23 per cent in 1866–1936. France's population became relatively stationary, therefore, after 1866. Exclusive of Alsace-Lorraine which was ceded to Germany upon the conclusion of the Franco-Prussian War, the population increased only 10 per cent between 1872 and 1911, that of the ceded territory meanwhile growing about 21 per cent. In 1921 after the return of Alsace-Lorraine the French population numbered only 38.8 million or 2 per cent more than in 1866. Although it grew 2.4 million or 6 per cent in 1921–1936, the 1936 population total exceeded by only 3.1 million or 8 per cent that of 1866. In short, in 1866–1936 France's population increased much less rapidly—only 8 per cent—than in 1801–1866 when it grew 38 per cent. While World War II occasioned a smaller population loss than did World War I—about 1.45 instead of 2.85 million—the period 1936–1946 witnessed, according to the census returns, a 2 per cent decline. In 1946 France's population numbered about 40.8 million or only 7 per cent more than in 1866. By mid-1951 the postwar rise in natural increase, supplemented by some immigration, had raised France's population to about 42.2 million or 11 per cent more than in 1866.

France's population growth in 1801–1936—about 14 million—reflects the combined influence of net immigration, the prolongation of life, and the force of reproduction. During this period Landry estimates immigrants, together with their descendants, added about 5.5 million while the prolongation of life accounted for another 16.8 million. From this estimated increase must be subtracted 3.3 million representing the natality and mortality losses occasioned by World War I and an estimated loss of 5.3 million imputable to the decline in reproduction.

Net migration, mortality, and natality behaved somewhat differently in France than elsewhere in Europe in 1801–1936. France was the only European country to experience considerable permanent immigration, most of the others experiencing considerable emigration. Life expectancy and true mortality while more favorable in France than in southern and eastern Europe was somewhat less favorable than in the British Isles, Scandinavia, and several of the smaller West European countries. Prior to the nineteenth century gross reproduction in France may have been as high as 2.65, the level found in East Europe in the late nineteenth century, but by 1800–1820 it had fallen to a level of 2.0. Even so, the French rate was below those obtaining elsewhere, and it remained below until after World War I when gross reproduction in several countries descended below the French level. While the long-run trend was downward in all countries, the French rate fluctuated less than did rates in other countries. Net reproduction declined less and more regularly in France than in other representative countries in 1806–1936, moving from 1.08 in 1806–1820 to 1.01 in 1841–1850 and 1.01–1.04 in 1861–1890 and thereafter declining gradually to .89 in 1936–1939. Even so, net reproduction in France in the 1930's slightly exceeded that recorded in several West European countries.

II

Prior to the nineteenth century France was the demographically dominant power in Europe. Within the confines of France lived about 20 per cent of Europe's population in 1650 and about 15 per cent in 1750. In 1800 the fraction of Europe's population situated in France still approximated 15 per cent, but thereafter it declined appreciably. For Europe's population increased in 1800–1900 at a rate about two and a half times that experienced in France, and, in 1900–1940, at a rate about five times the French rate. By 1850 France's population comprised

about 13.5 per cent of Europe's; by 1900, about 9.7 per cent; and by 1939, about 7.9 per cent.

The deterioration in France's relative demographic position was checked only slightly and then but temporarily by the improvement that took place in the age structure during the first fifty or so years of the nineteenth century. This same improvement was subsequently experienced by other countries and then served to accentuate the growth of their populations of productive age relative to that of France.

The movement of population between France and the rest of the world made its relative international demographic position both more and less favorable than it otherwise would have been. For, whereas France sent abroad in 1801–1936 in the neighborhood of 3.1 million emigrants, there came to France from other countries in that same period about 7.1 million immigrants. Accordingly, immigration may be said to have contributed to France's population, as of 1936, about 5.5 million, of which 4 million represent the contribution of net immigration as such and 1.5 million the net natural increase of these net migrants. The migrants who came to France were drawn there largely by anticipation that their economic prospects would be better than in their home countries.

The relative smallness of the number of France's emigrants must have contributed to the weakness of her relative demographic position. For migrants are the principal bearers of the value patterns and tastes peculiar to nations and cultures, while migrants and their descendants, at least so long as they retain esteem for the values and tastes and inhabitants of the mother country, will give it support and may win support for it among other peoples. In the period 1846–1932 about 52 million emigrants left Europe, of whom but 1 per cent were of French origin. For of the 2.8 million French who emigrated from France in 1851–1933, 800,000 remained in Europe while about 34 per cent of those who crossed the sea went to the French colonies. In the 1930's there lived in foreign lands about 540,000 Frenchmen, and, in the French colonies, about 2,322,000 French citizens who made up about 3.3 per cent of the population of these colonies.

III

Let us now see how income, savings, and capital formation behaved in France vis-à-vis other countries and then ascertain if this behavior

was affected by population movements. There is little point to examining the movement of aggregates, for aggregate income and savings increased less rapidly in France, falling increasingly below the British and the German levels in the second half of the nineteenth century, because the labor force of France increased less rapidly than that of Britain and Germany. Attention here will be focused, therefore, upon per capita and per worker data.

In the first half of the nineteenth century output per worker in France, while lower than in Britain, apparently was higher than in other European countries for which estimates are given by Clark. After 1870, however, output per worker in Germany rose above that in France. Output per worker rose above the French level in Holland, Denmark, Norway, and perhaps in Belgium during the first decade of the present century, and, after World War II, in Sweden; it was higher in Spain after 1900, if not earlier. Clark's estimates suggest that output per employed worker grew at approximately the same rate in France and Great Britain between the 1830's and the 1860's—about 1⅜ per cent per year—and at a higher rate in Germany—close to 2¼ per cent per year. During the last three or four decades before World War I the rate at which output per employed worker increased declined in all three countries, falling slightly below 1 per cent per year in both England and France and approximating 1 per cent in Germany. This deceleration, reflected also in wage data and experienced even in the United States, though not yet adequately explained, has been attributed in part to the fact that the late nineteenth-century inventions made for new products rather than for reductions in the resource costs of old products. During the period intervening between just before World War I and the best of the interwar years, the annual rate of increase was higher, approximating 1¼ per cent in Britain and Germany and 1¾ per cent in France. This last figure loses significance, however, since France enjoyed very few years of prosperity during the interwar period.

Output per worker in agriculture, being relatively sensitive to changes in the ratio of agricultural workers to land, remained higher in France than in Britain until around 1911 and higher than in Germany until the interwar period. Clark's figures indicate that output per employed worker in manufacturing in France always lagged behind that reported in Britain and Germany, and (assuming his estimates to be sufficiently reliable) that output per employed worker in manufacturing did not rise above output per male worker in agriculture until the closing third of the nineteenth century. Output per worker in tertiary occupations,

always higher than in primary and secondary industries, was higher in Britain and Germany than in France. The growth of per capita output in France, relative to that in Britain and Germany, was slowed down somewhat, since the French labor force was slower than the British and the German in moving out of agriculture into secondary and tertiary employment.

Despite France's reputation as a nation of savers, net saving was less in France than in Britain or Germany throughout most of the period 1860–1930. Between 1871 and 1911 France saved about 10 per cent of her national income; Britain, about 12 to 15 per cent; and Germany, about 15 to 20 per cent. In the 1920's the German rate was close to 10 per cent while the French rate, now slightly above the British, was slightly below the German. As a rule, the German rate, expressed in terms of savings per head, was appreciably higher than the British, and the British appreciably higher than the French. Account must be taken also of the fact that France placed a larger fraction of her investment abroad than did Britain and Germany, the proportion of French savings going abroad rising from about one third in 1850–1870 to over one half by 1911 while the corresponding British and German figures were about one fourth and one tenth. Reproducible capital per person in work was lower in France than in Britain prior to the 1860's and than in Germany by the period immediately preceding World War I.

The comparative lowness of these figures is reflected in the amount of equipment used per worker in France. In the 1920's France ranked ninth among the nations of Europe in the consumption of machinery per capita; in the 1930's it ranked below Germany, the United Kingdom, and several smaller European countries in steel consumption per capita. In 1937 energy consumption per person engaged in agriculture, mining, and manufacturing was not much more than half as high in France as in the United Kingdom. In both 1929 and 1939 France ranked seventh among the countries of Europe in terms of daily output per capita from all major sources of energy.

IV

Population growth may affect, in various and unlike ways, the rate at which equipment per worker increases. First, when a population is growing relatively rapidly, more capital must be formed to provide the same increment in equipment per worker than when it is growing relatively slowly. Second, if, as some economists believe, the relative slow-

ness with which a population grows makes for underinvestment and underemployment, actual national income will fall below potential national income, with the result that capital per head is formed less rapidly than when population is growing more rapidly. Third, saving may be both checked and stimulated. If slowness of population growth makes for a more favorable population-resource ratio, with economies of organization remaining unaffected, per capita income and per capita saving will tend to be higher, *ceteris paribus,* when a population is growing slowly than when it is growing rapidly. This inference is supported by the fact that, other conditions being given, the capacity of individual families to save is inversely related to the number of dependent children in the family. Population growth may, however, affect these other conditions. The relative number of older dependents increases as population growth declines. When a population is relatively sparse and relatively evenly distributed in space, income tends to be distributed more equally than when a population is relatively dense and relatively concentrated in space, with the result that, *ceteris paribus,* saving tends to be less under the former than under the latter conditions. Furthermore, the spread of childlessness in a bourgeois culture may, as Schumpeter suggests, diminish the value attached by a people to making "provision for an indefinite future." Unfortunately, information is lacking respecting most of these supposed effects.

While French employment data are inadequate to reveal the influence, if any, of the decline in the rate of population growth upon employment, France's trade-cycle history does not indicate any significant difference from that of countries whose populations were growing much more rapidly. In France the ratio of years of prosperity to years of depression compared very favorably in 1840–1925 with the corresponding ratios observed in other countries. Furthermore, variations in the length of the trade cycle in France did not differ significantly from variations experienced elsewhere. Presumably, trade-cycle behavior in France reflected the fact that France was somewhat less industrialized than Britain or Germany. French experience lends some support also to Cassel's view that, "if outside labour can no longer be attracted, or only to a slight extent, trade booms cannot occur again with anything like their former intensity." According to this view, outside labor may be drawn from the pool of disguisedly unemployed workers in agriculture or from the stream of immigrants and native-born persons flowing into the labor-force pool for the first time. From none of these sources could labor flow in sufficient volume to give sustained impetus to a

boom. Rural natural increase was not very high, while the active agricultural population did not begin to shrink until after 1896 and then only at an average annual rate of about 35,000. Nonrural natural increase was not high. The immigrant population grew slowly, as a rule, and, when economic conditions became adverse, some of its members returned to their homelands, thereby reducing the pool of unemployed workers in France.

Whether the rate at which France's population was growing significantly affected the rate at which capital was formed is not clear. French age composition was not particularly conducive to dissaving. The saving rate may have been relatively low because income was somewhat more evenly distributed in France than in Britain or Germany; in part, perhaps, because of France's population situation, for the slowness with which population grew checked the development of both metropolitan centers and the pressure of numbers upon land and other resources, each of which forms of development may conduce to greater inequality. French savings may have been lower also because produced income per worker was lower in France than in Britain or Germany; yet the German saving rate exceeded the British even though produced income per worker was lower in Germany than in England.

Technical progress apparently contributed less to income growth in France than in Germany and England. In 1893–1913 France's labor force increased about 12 per cent; her produced income, about 26 per cent; and reproducible capital invested in France, about 1¼ per cent per year, since about one half her savings was exported. At this time Tinbergen estimates the elasticity of productivity of labor was in the neighborhood of 0.7; that of capital, 0.2; and that of other agents, about 0.1. Application of Tinbergen's coefficients to the increments in France's labor force and capital stock yields a 14 to 17 per cent increase in produced income. The remaining 9 to 12 per cent increase—about ½ per cent per year—may be attributed largely to what Tinbergen calls "technical improvement" or applied invention. Application of Tinbergen's coefficients to data for 1875–1911 and 1853–1911 suggests an even lower rate of technical improvement—about ⅓ per cent per year. Tinbergen's own studies suggest, however, that technical improvement in a group of countries, of which France was one, increased income about 1 per cent per year.

Population growth may produce a dynamic effect just as do invention and innovation. First, it may make possible economies, such as those arising from greater division of labor, which more than offset the ad-

verse effects of increases in the pressure of numbers upon resources. Second, it may generate a psychic and material milieu that is relatively conducive to salutary change and flexibility; to the exercise of inventiveness, innovation, and effort; to the effective utilization of capital; and, perhaps (in the longer run), even to the formation of capital. While most theorists accept the first proposition, they are not in agreement respecting the magnitude of the income-optimum population for France. Some hold that by the latter part of the nineteenth century France's population was sufficiently large—given her external relations and the state of technology—to exploit division of labor and related sources of economy as fully as was economically justified by the available land and raw materials. Others, among them Sauvy and Létinier, put the optimum for France at 50 to 75 million. Sauvy points out also what writers usually overlook, that when unproductive outlays, such as those for military purposes, are relatively high, a larger population than otherwise would be indicated is required to maximize per capita output and consumption of nonmilitary goods and services. Concerning the validity of the second proposition there is not much that can be said here except that it is very difficult to isolate any dynamic influence exercised by the population variable. Population growth can produce the effects indicated only if there are present in a people's value and culture patterns the necessary facilitating elements. Furthermore, these effects may also result from nondemographic changes. The lowness of the rate of technical improvement reported in the previous paragraph suggests that population growth in France in the period 1850–1911 and perhaps in the past one hundred fifty years has produced little or no dynamic effect under the head of either of the above propositions, for the disclosed rate of technical improvement is so low as to appear imputable entirely to invention and innovation. If this be the case, one might then argue that the present French population may be above the income optimum in size though not necessarily above the military-income optimum.

Cultural factors appear to be much more responsible than purely economic factors for the slowness with which output per worker has progressed. For, while France's resource potential is limited, including only 1.2 per cent of the world's iron and only .4 per cent of the world's energy reserves (exclusive of fissionable materials), the French economy is making inadequate use of the energy and other resources at its disposal. It has been shown that, since energy consumption tends to reflect the use of capital and efficient methods generally, a 1 per cent increase

in a nation's energy consumption tends to be accompanied by about a ½ per cent increase in output per worker. Yet in 1937 French per capita energy consumption was only one sixth above the over-all European level and below that of at least five leading European countries. Inadequacy in the amount of energy and equipment at the disposal of the French worker is only the immediate cause of the slowness with which produced income progresses. Back of this lie other causes that are more ultimate: the unenterprising character of so much French entrepreneurial behavior; heterogeneity of consumer tastes; hostility to innovation, mechanization, standardization, and selective, cost-reducing competition; unconstructive approaches in the field of labor-management relations; and so on. Not even these factors, however, account for the situation in a manner that is both sufficient and relatively ultimate. For, as Sawyer, Landes, and others have shown, French value patterns, French tastes, the heterogeneous nature of France's cultural heritage, together with the conflicts produced thereby, are acting in combination with other elements in social structure and culture to restrict economic development. These elements, together with France's then political situation, probably played a much larger role than did the slowness of her population growth in diverting savings abroad before 1914. Professor Sauvy's analysis suggests that these elements have also played a part, together with the curtailment of economic competition, in generating an occupational structure not suited to France's economic needs and not sufficiently conducive to the augmentation of real income.

V

Our discussion thus far has had to do principally with the economic reaction of French individuals to a changing demographic situation. Men may also react collectively, in part, because some individual aims can best be pursued collectively, and, in part, because every collectivity as such has ends whose pursuit is variously facilitated by a considerable portion of the population composing it.

Collective reaction to France's population situation has been manifest for nearly a century. Concern was expressed already when deaths temporarily exceeded births in the early 1850's. The alarm many felt at the time the German state was undergoing consolidation became intensified when that country, with a military man power not greatly different from that of France, defeated her. The prescient then foresaw that, given prospective trends, Germany's military man power would steadily out-

strip that of France whose status in time would become that of a second-rate power, since victory in historic struggles usually went to growing populous states. Their forecast was borne out, for on the eve of World War I both France's military man power and her income-producing capacity were not quite six tenths that of Germany's. By 1939 the German margin had become appreciably greater.

Two types of action were advocated. On the one hand, measures designed to stimulate natural increase and immigration were proposed and after a time adopted in a slight degree. On the other hand, efforts were made to enlist sources of strength that might make up in part the growing relative deficiency in French military man power and economic strength. Let us consider these types in reverse order.

In this second category fall, besides France's search for allies, her utilization of savings for international political purposes, her post-1870 colonial ventures, and some of her military man-power policies. Exporting one third to one half her annual savings, France, by 1912, had accumulated a foreign investment six times that which foreign investors had placed in France and approximately equal to two fifths of French capital in the form of stocks and one seventh of French wealth. Since three fourths of these loans went to foreign governments, and only 9 per cent flowed into France's colonies, France, unlike England, failed to develop effectively her own overseas territories or to build up permanent markets for her products and permanent sources of raw material. Her failure in this respect, of course, may be, in part, that there were so few French emigrants and bearers of French culture to generate economic situations highly complementary to the French economy. Between 1914 and 1919 about 82 per cent of the net foreign holdings of French investors, as of 1914, were wiped out. By 1938 France had again accumulated considerable foreign holdings only to have much of their value destroyed. While France did not derive outstanding economic gain from pre-1914 foreign investments, she probably enlisted considerable political and military support through them, in particular that of populous and strategically situated Russia, but she acquired this support at the expense of her own and her colonies' development.

France's post-1870 colonial ventures were inspired in part by her supposition that, since her population growth did not permit continental expansion, it might still be possible, despite her slow demographic growth, to develop a colonial empire whose strength would greatly augment her own. French natality would be stimulated, it was believed, by the resulting emigration. Militarily she sought to offset Germany's

greater man power by calling into service a much larger fraction of the population eligible for such service. However, the strain occasioned by this method made France anxious to enter into an alliance with populous Russia and prompted some of her military leaders to develop plans for the military and the economic use of her colonial man power in the event of war. Unfortunately, however, French military theory and practice did not develop in a way suited to make economic use of her military man power, with the result that France's losses were relatively heavy in World War I.

The promotion of immigration is considered very important by French population students. Formerly, interest was expressed principally in the size of the immigrant stream. Since the war, however, great stress has been placed upon the age structure of the immigrant population. Because of the impact of war and past variation in natality, the French age structure is uneven, and it will remain uneven for many years even though fertility and mortality become relatively stable. For example, given a continuation of the demographic conditions of 1946–1950 and the resulting slight increase in the population, the percentage of adults in the population, about 54 per cent in 1950, would by 1965 fall nearly to 48 per cent and then, as the population approached stability, settle in the neighborhood of 52 per cent. Other growth patterns yield even greater declines in the relative number of persons of productive age. Whence dissaving by the aged and a decline in productivity are apprehended.

A decline in the relative number of persons of productive age can be met through the deferment of retirement, through the diminution of retirement pay, or through the introduction into a country of enough persons of appropriate age. Prompted in part by fear that the decline in prospect might affect adversely both the family-allowance system and the social-security program, some French students in 1946 put France's immigrant needs at 3 to 5 million, with young adults predominating. Yet not even a minimal estimate of some 100,000 adult immigrants per year has been realized, only 70,000 net of all ages entering France in intercensal 1936–1946 and about a half million since then. Among the circumstances held responsible for the smallness of the immigrant influx are France's failure to enlist and assimilate immigrants effectively, and the fact that East European sources of supply have been cut off.

Opposition on the part of three quarters of the French population to the admission of immigrants prevents the development of an effective, large-scale immigration program. This opposition, which is most pro-

nounced in wage-earning groups and which formerly was fed by the indisposition of immigrants to join trade unions, is based on both fear of immigrant competition and hostility to the cultures of the immigrants; it is not prompted by the Walker immigrant-native-replacement theory which had some currency in nineteenth-century France. The prospective competition of the immigrants is exaggerated, however, for relatively most of them enter less popular employments (for example, mining) and therefore complement rather than compete with most French workers.

Most important of the sets of measures proposed in the nineteenth century to check the downward trend in natural increase was that providing varied economic assistance for families with children. Such measures ran counter to the bourgeois scheme of values and, being based on the principle of need, had to wait for enactment until egalitarian sentiments had become sufficiently strong. For a long time, therefore, the proponents and executors of these measures seemed bent upon trying, though with little success, "to buy babies at bargain prices," since only a small part of the nation's resources was directed to this purpose and since, insomuch as the family-wage system was relied upon, support of family assistance probably came principally out of labor's imputed product.

The family-wage system did not get effectively under way before World War I. Thereafter, despite the temporary opposition of non-Catholic trade unionists, it continued to grow under private auspices until 1932. In that year the state intervened to make membership in a family-wage equalization fund compulsory for employers and thereby to establish the principle of need as a legal determinant of wages and the right to income. In 1939, with the effectuation of the *Code de la Famille,* the fundamental basis of the present system of family aid was completed. For this measure made possible the bringing of the whole population under the family-allowance system, introduced uniform administrative rules, and, by emphasizing pronatalist objectives, effectively distinguished family allowances from ordinary earned income and established a basis for increasing subsidization of the system by the state. In the decade that followed, family assistance was variously augmented while the pronatalist features of the system were strengthened. Even so, the system is still largely financed by employers, though it is now almost universally accepted as a part of the income-distributing mechanism and looked upon as harmonizing the interests of both contemporary groups and successive generations.

The French family-allowance system is not a widow's cruse and is not likely to become one unless output per worker and the aggregate produced income increase greatly. In 1949 the French system, though more generous than the British and the Belgian systems, provided at most only 74 per cent of a child's needs and, in some groups, less than half. Presumably, public expenditure upon youth, which in 1950 approximated 10 per cent of the state budget and nearly 3 per cent of the national income, can be increased. Yet this source is limited, even given effective taxation, since, as of 1950, 71 per cent of the national income would have been required to provide everyone with a "social minimum." Moreover, as the relative number of unproductive aged increases further, more funds will have to be provided for their support, since their resources are limited, and since the needs of an old dependent exceed those of a young dependent. Furthermore, the present shortage of housing and related needs can be overcome only if the comparatively inelastic building industry is sufficiently augmented. Finally, in view of the fact that France already has one of the highest labor-force/population ratios —about 0.5—and that, therefore, the addition of more women workers and the deferment of retirements cannot swell French production significantly, produced income can be greatly increased only if the economy is completely reorganized and modernized.

Despite the difficulties noted, however, natality held up well during the war years and, along with marriages, greatly increased thereafter. In 1946–1950 births were 35 per cent above the 1934–1938 level, and natural increase augmented the population by about 4 per cent. Should the annual number of births remain at 850,000 and life expectancy at birth rise to 70 years, France's population will increase to 61 million even without the assistance of migration, while, if late-1940 net reproduction persists, the population will grow nearly 1 per cent per year. It remains to be seen, however, whether the family-allowance system, together with the social and psychological factors that operated during and after the war, have produced a sufficient change in the French system of values to ensure 850,000 births per year. Public-opinion polls indicate that the average number of children desired per family approximates 2.4, whereas, given current nuptiality and fertility, a standard family of 2.5 to 2.6 children—only about three tenths of the number required two hundred years ago—is needed to replace the population. There is evidence of an increase since 1947 in Malthusian sentiments and in the belief that living standards have fallen. There is evidence also that factors which formerly affected fertility (for example, religi-

osity; size of community; employment; group social and income differences) are still active.

A nation's rate of population growth is dominated ultimately by two factors: the level and content of the aspirations of its members and the supply of goods and services continually available for the satisfaction of these aspirations. Presumably, a population's elasticity, though less than unity, frequently tends to be positive. This inference is supported by the positive correlation found to obtain between indices of both migration and reproduction and indices of economic activity, and it should be borne out by comparisons of the relative rate of increase in national income with the relative rate of increase in population lagged slightly. Unfortunately, the French income data do not permit a satisfactory determination of French population elasticity in the period 1840–1914. The elasticity, while positive, fluctuated, being highest when income increase was lowest and lowest when income increase was highest. Presumably, therefore, variation in aspirations, short-time insensitivity to variations in real income, and the residual effects of earlier demographic and related events, together with other factors, must have intervened continually in France to offset the population-increasing influence of income growth.

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Bibliographical note. In this paper, which is a continuation of parts of my *France Faces Depopulation* (1938), I have made use of A. Landry's *Traité de démographie* (Paris, 1949), A. Sauvy's *Richesse et population* (Paris, 1944), *Population,* and other publications of the Institut National D'Études Démographiques, publications of the Statistique Générale de la France, *Population Studies,* J. Tinbergen's (with J. J. Polak) *The Dynamics of Business Cycles* (Chicago, 1950), Colin Clark's principal studies of the growth and distribution of income and savings, and a large number of monographs and special studies relating to the particular points under discussion. Lack of space prevents a detailed indication of sources.

Population Growth and Economic Development in Japan *

TODAY there is a plethora of pessimistic literature on the population problems of densely settled agricultural areas. It is matched, if not exceeded, in quantity by the optimistic writings of those who see economic development as a panacea for demographic ills. There is research, too, but the definitions of problems, the analytical approaches, and the conclusions reflect the cleavages of academic specializations. Demographers deprecate the realistic possibilities for economic development and so project present populations into future situations that must be catastrophic if the cynicism concerning economic expansion is justified. Economists analyze the potentialities for development and assume some mystical force in human reactions that automatically reduces rates of population increase as the material basis of living becomes more abundant. Analysis of the relations between population increase and economic development is notably deficient. The difficulty lies deeper than the naïveté of social scientists. That quantitative research for which they are prepared requires statistical materials, but those materials exist primarily for the advanced industrializing economies of Western origin. These are precisely the economies in which the relations between people and economy have been or are in process of being rationalized through controlled human reproduction. The techniques of the historian and the anthropologist must be combined with those of the economist and the demographer for the analysis of social, demographic, and economic relations within prestatistical cultures.

This is preface to the presentation of Japan as an area for research in economic-demographic interrelationships. Japan is the only country of non-Western culture that has achieved substantial industrialization.

* The summary analysis presented here is derived from comprehensive analysis of the demography of Japan being conducted under the auspices of the Office of Population Research of Princeton University. Citation of the sources utilized is impossible within the scope of a few pages, for they include the historical records in Japanese and Western language; the cultural, economic, medical, and demographic analyses of various subjects and areas by Japanese and Western scholars; the policy-oriented literature, and the massive statistical publications of the government of Japan, the colonies, and various of the minor geographical areas.

It has a statistical tradition that extends backward into the legendary period, while its modern census enumerations and vital statistics are among the most accurate in the world. Its written social and economic history begins in the seventh century A.D. and becomes increasingly massive over time. These records of over twelve hundred years of legendary and historical development permit retrospective analysis of population growth and economic expansion under widely varying conditions of resources, culture, techniques, and social organization. They invite historical comparisons of demographic-economic trends in agrarian and industrial structures as they evolved in Japan and contrasts between the relationships of people and economy in Japan and other countries. However analyzed and for whatever purpose, they demonstrate persistent interrelationships between economic development, population expansion, and cultural change.[1]

The broad pattern of Japanese population and economic development was inherent in the location of the islands in the outer path of the diffusing culture of China. Sometime in the last millennium B.C. elements of Chinese Bronze- and Iron-Age culture reached this peripheral region on the Asian frontier beyond which there could be neither movements of men nor expansions of culture. Techniques of agriculture and implements made of iron permitted the groups who possessed them to push back the still Neolithic peoples who lived by hunting and fishing. Simple developments in trade and communication paralleled the transition to rice agriculture. Ships moved from Kyushu to Korea, and from Korea came sericulture, weaving, ceramics, carpentry, and leather processing, together with luxurious articles of gold and silver, jewels, and rich textiles. Refugees from the dynastic wars of the main-

[1] Consideration of these broad topics in a few pages would seem to require a choice of alternatives: a detailed analysis of a limited segment of Japanese experience or a résumé of the events of centuries of recorded history. Since neither seems feasible, we shall emphasize the great reorientations of Japanese culture: the Taiko reforms whose goal was the creation of a replica of T'ang China in seventh-century Japan; the period of seclusion whose goal was the coexistence of the political power of the industrial state with the social values of the agrarian culture; and the occupation whose goals had best be described at some future period. The focus of attention will be the national state of Taiko and the secluded feudalism of Tokugawa, since both economic historians and demographers can be assumed to be familiar with the outlines of Japanese development after 1868.

This seemingly episodic approach reveals the planned national reorientation as another factor of continuity in Japanese history. At each of these periods of crisis the transformation of society and economy was ordered by fiat. In each, population and economic changes were both causes and consequences of political reorientations. In each, changes that appeared revolutionary became evolutionary integration of alien and indigenous elements into a continuing culture that became and remained specifically Japanese. In fact, the nearest to the unique in Japanese development was neither the economic nor the demographic, narrowly conceived, but a continuity in social structure and in the discipline and conformity of the people.

land brought not only techniques and products but literature, writing, and Buddhism.

The cultivation of the soil permitted an increasing population that in turn generated pressures for the expansion of areas of cultivation and the improvement of yields. Territorial expansion, population increase, and migration weakened the political and social controls of the pseudo-consanguineous clan structure, while central political control was threatened by the rise of powerful local chieftains. A government that was an unstable coalition of clan leaders, a population whose increase and mobility made the concept of the clan a fictitious survival, and an imported culture of literature, philosophy, and aspirations unrealizable at existing levels of production and distribution could not coexist indefinitely. The resolution of this early crisis in the relations of people to resources and production within an expanding economy might have come through the reappearance of localism or through an indigenous reintegration of power. There was an alternative, however. The culture of China had produced rice agriculture, sericulture, metalworking, Buddhism, and Confucianism. Now, in the dynasties of Sui and T'ang, it evolved an integrated governmental and social structure to facilitate the centralized functioning of an economy and a culture more extensive, more populous, and richer than that of the Japanese on the periphery of Asia.

I

The Taiko reforms of 645–650 A.D. provided the official basis for the creation of a replica of the culture of the T'ang dynasty in seventh-century Japan. All lands and properties were declared the property of the state, with sustenance grants given to the overtly dispossessed persons of rank. Communication and transportation facilities were to be developed throughout the area under state control, with a bureaucracy centrally appointed to administer the country on a territorial basis. Registers of population and land were to be established as the basis for an initial distribution and a periodic redistribution of land in relation to family size and composition. Taxes in commodities were to replace labor, although all areas were to owe contributions of post horses, weapons, and man power proportionate to the number of households.

There was great activity in the centuries that followed the Taiko reforms. In the areas under central control an elaborate bureaucracy reached down through provincial governors and district chiefs to the

headmen of villages and the small groups of households. Economic and demographic expansion proceeded together, sometimes one and sometimes the other advancing more rapidly, and correlated with them went a northward push that gave the central government control of all Honshu by the end of the tenth century A.D. Severe demographic maladjustments were thus postponed, but they could not be averted. The theory of Taiko provided for the periodic redistribution of *ku-bunden* (subsistence rice fields) in relation to family size and composition. If this provision had been equitably and universally applied, the initial effect would have been rapid population growth, for the subsistence available to the marginal consumer would have increased. There is some indication that such in fact was the effect of the land reform in the regions in which it was carried out. The area within which there was stability was increasing, and agricultural techniques were improving. However, land available for redistribution soon became inadequate for all the claimants. The periods of time between allotments were increased, and the amount of land allotted per household was reduced, but still there were complaints that the rice lands were inadequate. By the early years of the eighth century the government was ordering the transfer of families from the older provinces to the frontier areas where they could extend the cultivated acreage at the same time that they served as palisade guards against the unpacified aborigines. These frontier movements were slight in view of the magnitude of the needs, though, and so the Great Council of State became concerned with the population problem. The councillors planned vast reclamation projects that would double the cultivable land of the country, but managerial ability and finance capital were too limited for massive governmental operations. Motivations for private works were limited, for redistribution removed individual and familial profit motives as stimulants to development.[2]

The economic problem in Japan was not the simple one of producing a quantity of food that would maintain the people if it were evenly distributed. There was no concerted drive for the amelioration of the population problem through equalization of distribution. Instead, a proliferating aristocracy generated material demands beyond the productive

[2] The councillors attempted to solve the difficulty through granting exemptions from reallocation for three generations to those who built new irrigation works, for one generation to those who developed new fields that utilized existing facilities. Thus the Great Council, in attempting to bolster the functioning of the allotment system in a situation in which population growth was outstripping available land, introduced the exceptions from allotment that quickened the growth of a manorial structure of economy and society.

capacity of the countryside at existing and even improving technical levels. The luxury of the capital city of Heian meant increasing demands for extraction of product from the peasants. Social imitation complicated the problem, for lesser peoples in the capital and the provinces developed standards of living beyond the crude ones of the past. By the beginning of the tenth century the tax structure was a complex system that left little alternative to peasant or provincial noble other than to attempt to escape it. As the apparatus of the central government deteriorated the *shoen* (manors) increased in numbers and in power. Disintegration into localism again threatened, but in the centuries of struggle that followed new consolidations emerged in the form of the hierarchical vassalage of feudalism.

II

In Taiko the intellectual élite of the relatively cultured south-central region had reached out for change and progress; in the middle ages military leaders from the frontiers of the northeast struggled to organize a centralized state that would provide order and stability. The structure they created was basically feudal. It continued as a form of organizing the people and resources of the state for some seven hundred years, from the earliest government at Kamakura in the twelfth century to the last at Edo (Tokyo) in the nineteenth. During these centuries the Japanese economy developed from a simple and largely fragmented one that supported six to nine million people to a unified and fairly complicated one that supported thirty million people. The period was not homogeneous with reference to political order, however, and population growth followed no regular pattern either of change or of stability. From the late twelfth to the late sixteenth century there was an alternation of order and conflict, of centralism and localism. The resolution of the problems of instability and disorder came in the late sixteenth century with the formation of the Tokugawa shogunate (*baku-fu*). The police state established by the Tokugawa shoguns survived with slight political changes through almost three centuries of relative seclusion from the outer world.

There is an interpretation of the dynamics of population during the period of seclusion that is well established in literature. According to this interpretation, population fluctuated irregularly but with a generally upward trend during the centuries of halting political and economic advance, roughly from the thirteenth through the sixteenth

century. It increased rapidly during the first century and a quarter of the period of seclusion when peace and generally enlightened agrarian policies resulted in simultaneous increases in the food supply and decreases in the chances of death. Then from the first quarter of the eighteenth century to the middle of the nineteenth century population remained relatively unchanging. The results of official counts and fragmentary vital statistics apparently attest the existence of this period of approximate stability. Two types of arguments are adduced to explain it. One, economic in orientation, finds here a population that has increased to the physical limit permitted by subsistence. The other, crudely psychological in nature, attributes stability of numbers to abortion and infanticide. If the former interpretation is substantiated, we have a documented Malthusian situation. If the latter interpretation is substantiated, it follows that the demographic development of modern Japan is atypical of the past growth of Western peoples or the potential future growth of Eastern peoples, for Japan would have begun the process of industrialization with a low and consciously controlled fertility. The birth rate rather than the death rate would have been the variable governing growth.[3]

Analysis of the prolific quantitative and verbal descriptive materials available indicates that the presumed stability of numbers in the presumably unchanging agrarian economy of the late Tokugawa period is mythological. It is true that numbers had increased until population was extraordinarily dense on the land, considering the technical levels in agriculture and related segments of the economy. However, the dynamic sections of the society and economy were urban and commercial rather than rural and agrarian. The shogunate required the *daimyo* (feudal lords) to spend alternate years of residence in Edo and to leave their families as hostages for their return. Great cities developed as centers of conspicuous consumption, with the extractable rice and other

[3] The demographic evolution of Japan during the feudal period is fundamental both to the assessment of the population dynamics of Japan during the period of industrialization in the late nineteenth and early twentieth centuries, and to the evaluation of the extent to which the past experience of Japan is relevant to the future experience of other nonindustrialized Asian areas. Japanese developments should be traced for three major periods: the move toward centralization in the Kamakura period; the instability that culminated in the Muromachi period; and the seclusion of the Tokugawa period. These are somewhat artificial distinctions though, for feudalism came by evolution. Its origin traces to the growth of the *shoen* (manor) centuries before the feudal period began, and it extends beyond its legal termination in the restoration of 1868. Its demographic consequences have varied according to the balance of the forces of internal order, economic dynamism, social mobility, and cultural change. Here considerations of space force limitation to the most controversial period in Japanese demographic history, the last century and a half of the period of seclusion.

commodities of the countryside moving by road and ship to these concentrations of people, wealth, and handicraft production. Financial and commercial classes rose to equal and even exceed the landed barons in their ownership and control of resources and facilities other than land. The economic structure of the shogunate was crumbling under the impact of a commercial revolution even before the black ships of Admiral Perry "opened" the country to the West.

The appearance of stability in the population of Japan during the last century and a quarter of Tokugawa government was likewise fictitious. There were quite divergent rates of change in the various regions of the country over periods—years or decades in length. Numbers fluctuated sharply as great famines and epidemics decimated sections of the country, or years of good crops and relative freedom from epidemic restored the population to or beyond the levels previously attained. A slow and halting increase seems to have begun sometime in the early years of the nineteenth century as the commercial and handicraft revolutions gained impetus. Whatever the rate of population change, it represented the balance of a high death rate and a high birth rate. Abortion and infanticide occurred, but, if they had been as general as the spectacular accounts assume, a population subject to the hazards that existed in eighteenth- and early-nineteenth-century Japan would have declined precipitantly rather than changed slowly and rather erratically over the decades.

The interrelationships of factors in the presumably changeless police state of the Tokugawa were complex indeed. The accumulating frictions generated by demographic and economic change within a political structure resistant to change undermined that structure. In a superficial sense population was a passive factor in the internal transformations of economy and society. The high and fluctuating death rates of peoples subject to periodic famines and epidemics, the infanticide practiced by women in despair, the movements of the dispossessed and the adventuresome into the cities and the frontiers of settlement—these were products of the failure of economic expansion in a situation in which expansion was still possible. If analysis is pursued into the labyrinth of factors responsible for economic inadequacy, however, the coincidence of enforced political stability and an alteration in social structure that was product of, and tended toward, social and geographical mobility emerge as basic incompatibilities.

Scrutiny of the developmental span of the feudal period from the initial consolidation of the Muromachi *baku-fu* at Kamakura to the

eclipse of the Tokugawa *baku-fu* at Edo indicates the population factor as a powerful compulsion to change. Any given political, economic, and social structure impinged on the conditions under which the people lived, the quantities of food and the necessities available for their living, and the aspirations and motivations that influenced their activities. Mortality, fertility, and migration continually created new populations whose size, composition, distribution, and dynamics were the facts, the opportunities, and the problems of the political and social order and the economic system of production and distribution.

A changing population dictates a balance of the forces of change throughout economy and society. If that balance does not occur, or occurs in ways inconsistent with the population dynamics generated by the economy and the society, population emerges as a pre-eminent problem. This is what occurred in the last centuries of the period of seclusion. Neither Malthusianism, neo-Malthusianism, nor the psychological aberration of willed death is adequate as an explanation of the actual dynamics of population and economy.

III

Throughout the modern period, as in the past, economic development has stimulated a population increase that has constituted a powerful propulsion to further development and expansion. The colonization of Hokkaido and the more intensive utilization of the lands of the southern islands were expansion in the traditional pattern. They increased the quantities of product and the numbers of people without altering the balance of forces that determined births and deaths. The acquisition of the industrial and scientific basis of power as it existed in the West created alterations in economic and demographic potential that deviated from the traditional pattern. The imitation of China could lead to an extended and improved cultivation of the soil in the intensive manner developed by the Chinese, and it could produce some limited measure of trade and handicraft production. The forces that determined the hazards of death and the chances of birth were not altered, for the ways of working and living for the majority of the people continued in the round of the days and the seasons that constituted village life. The imitation of the West involved the increase of nonagricultural employment, particularly of an industrial type, and it moved the children of the peasants cityward. The total population of the country was perhaps 35 million in 1872, 64 million in 1930, and 73 million in 1940. The num-

ber of people in agriculture was less in 1930 than it had been in 1872. All the increase of the three quarters of a century that was the life span of imperial Japan was absorbed in nonagricultural employment and urban living in Japan or sent abroad. Nonagrarian pursuits and urban living were conducive to an eventual increase in the age at marriage and a decrease in the number of children born after marriage. The science that lay back of industry was also developed in the fields that lay back of medicine, public health, and sanitation.

Thus the economic development that followed the Meiji restoration was accompanied by, if it did not produce, that early decline in mortality and delayed decline in fertility that had led to the acceleration and then decline in the rate of increase of European peoples. The demographic transition occurred with industrialization in the East as in the West. The differences were in the speed and the detailed structuring of the transition, not in the fact of its occurrence. By 1940 Japan saw herself as the England of the Far East, with responsibilities for continental leadership far beyond her limited man power. The population that had been rationalization for expansion was now viewed as inadequate for the responsibilities anticipated from that expansion.

The population generated by three quarters of a century of economic expansion survived in major part to achieve some adjustment in a truncated land with leveled cities, destroyed industries, returned servicemen, and repatriated civilians. The goal of reagrarianism proved fantastic; economic policy gradually shifted toward restoration and further industrialization, albeit in a different political and social setting. The birth rate surged upward to the level of a decade and a half before; the death rate moved downward to Western levels under the impetus of the welfare and public-health activities of SCAP. The rate of natural increase rose to the highest level in Japanese history; the surplus of births over deaths reached 1.75 million in 1949. Total population enumerated in the census of 1950 was 83.2 million. Deeply pessimistic Malthusianism spread throughout Japan and the West. People were moving back to the cities, however, and by 1950 the developing employment opportunities outside agriculture were again reducing the labor force in agriculture. The birth rate fell sharply as economic difficulties in agriculture and increasing employment in cities contributed to the motivations for a limitation of births, and legal facilities for abortion and contraception furnished the means.

To predict the future of either economy or population would be foolhardy. The pattern of the demographic future lies in the evolving com-

plex of forces that include economic development, individual attitudes, familial values, social structure, political orientation, and international relations. However, the fact and the realization of population growth again constitute a powerful motivation for forced expansion, with the possibility of an economic disequilibrium that may again mold political forms in ways that are hazardous for the peace of the Pacific region.

IV

Population growth and economic development have been so intermeshed in the historical evolution of the Japanese people that they approach a single process. Considered separately or together, they were neither completely determined nor completely deterministic. People and economy were formed by political and social structures that were in turn molded by demographic and economic forces. These relations may be stated in three propositions: (1) at any technical level population increase is a stimulant to expansion in a dynamic economic situation, a propulsion to disequilibrium in a static economic situation; (2) the form and rate of economic expansion are conditioned by the demographic status of the society; (3) the growth and distribution of population are products of changing cultural factors in which the characteristics and dynamics of the economy are critical.

General statements that the various facets of a culture are interrelated are platitudes. The relations between population increase and economic dynamics assume a significance beyond the platitudinous if they are assessed in the light of the factors that in interaction determine population change. The historical and contemporary experience of Japan substantiates the evidence from Western countries that in agrarian societies mortality is more susceptible to culturally determined variation than is fertility. Mortality is sensitive to the quantity and the quality of the subsistence and the types and degree of the health hazards of the natural and social environments. Reproductive behavior is a product of the cultural channeling of the relations of the sexes, the succession of the generations, and the intimate associations of earthly and spirit world. Major changes in fertility occur only with fundamental alterations in the conditions of living and the values of the individual and the society.

Co-ordinated consideration of the broad structural generalizations and the more specific ones concerning the dynamics of the Japanese population yield hypotheses of relationships that are meaningful for

research and policy. It is at once obvious that the relationship of economic development and population growth, of economic stagnation and population stability, is a somewhat circular one. In a closed universe densely settled in relation to resources, technical levels, and social structures, the population increase that stimulates expansion must come from a prior decline in the death rate. That prior decline may come as aftermath of the cataclysmic decimation of a pre-existing population. It may come as the effect of a reduction in the external or biological hazards of existence. In the more spectacular and sustained developmental periods, lowered mortality was both product and stimulant of the development of new potentialities for economic expansion through the extension of the areas of utilization, the adoption and diffusion of new technologies, and the alteration of political and social organization. However, Japan was never a closed universe, even during the period of seclusion. The great stimuli to the expansion of people and economy were the technical or structural importations from the outside, first from the agrarian culture of China, later from the industrial culture of the West. The basic dynamism of the centuries flowed from the adoption and diffusion of imported technologies of production and organization.

The lowered death rate that permits growth and stimulates expansion is necessarily transitory in a society in which fertility and hence the potentiality of growth remain intact. Whatever the initial relationship between the rate of population increase and the rate of economic expansion, and however many the innovations in the techniques and organization of production and distribution, the undiminished rate of population increase generated by lowered mortality and stable fertility must eventually surpass the rate of economic expansion. Liquidation of this condition of disequilibrium may come through a decrease in the rate of population increase, that is, through increased mortality. The only escape from solution through heightened death rates is a new combination of conditions that restores economic expansion. But somewhere in a finite world there is a terminus to expansion. It should be noted that this termination is not economically determined in the sense that it represents the maximum sustaining capacity of the land and other resources in terms of food.

The assumption of a constant level of fertility determined by ancient conditions and uninfluenced by the opportunities and the vicissitudes of a changing culture and economy is unrealistic. However, analysis of the experience of Japan and other areas of the Far East indicates

that the fertility of regions or countries has been lowered substantially only in association with economic development that involved rising levels of living within an industrializing and urbanizing milieu.

The achievement of economic stabilization at or near the maximum productivity per capita at given technical levels and within social given structures thus requires precautionary control of growth by lowered fertility rather than consequential control by increased mortality. Economic development that does not alter the attitudes of individuals and the culture of the society in ways conducive to the limitation of fertility invites negation of the increases in levels of living and the declines in mortality that have accompanied it.

The experience of Japan suggests that the population problem economically defined or the economic problem demographically defined must be recurrent in all societies without substantial control of human fertility.

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